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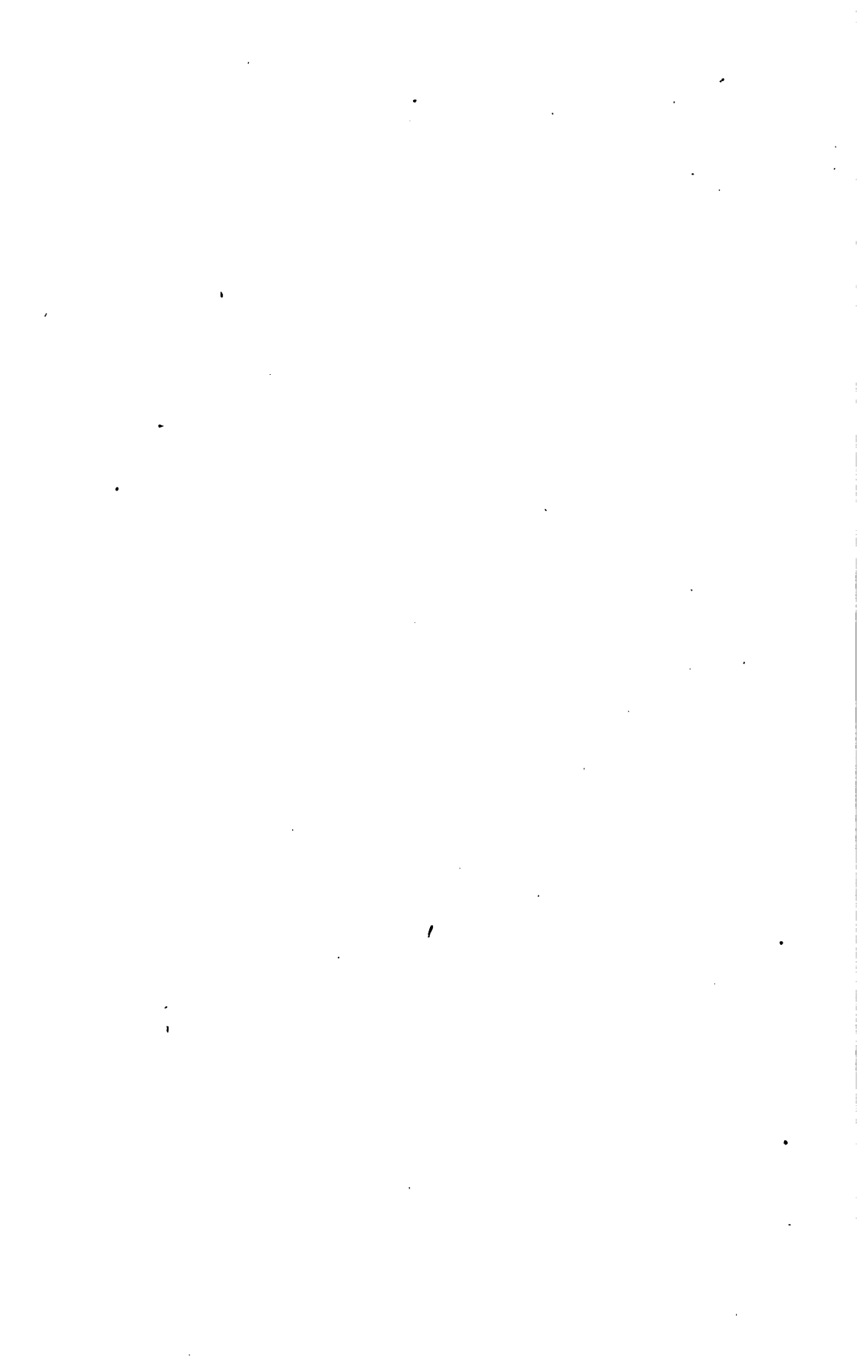


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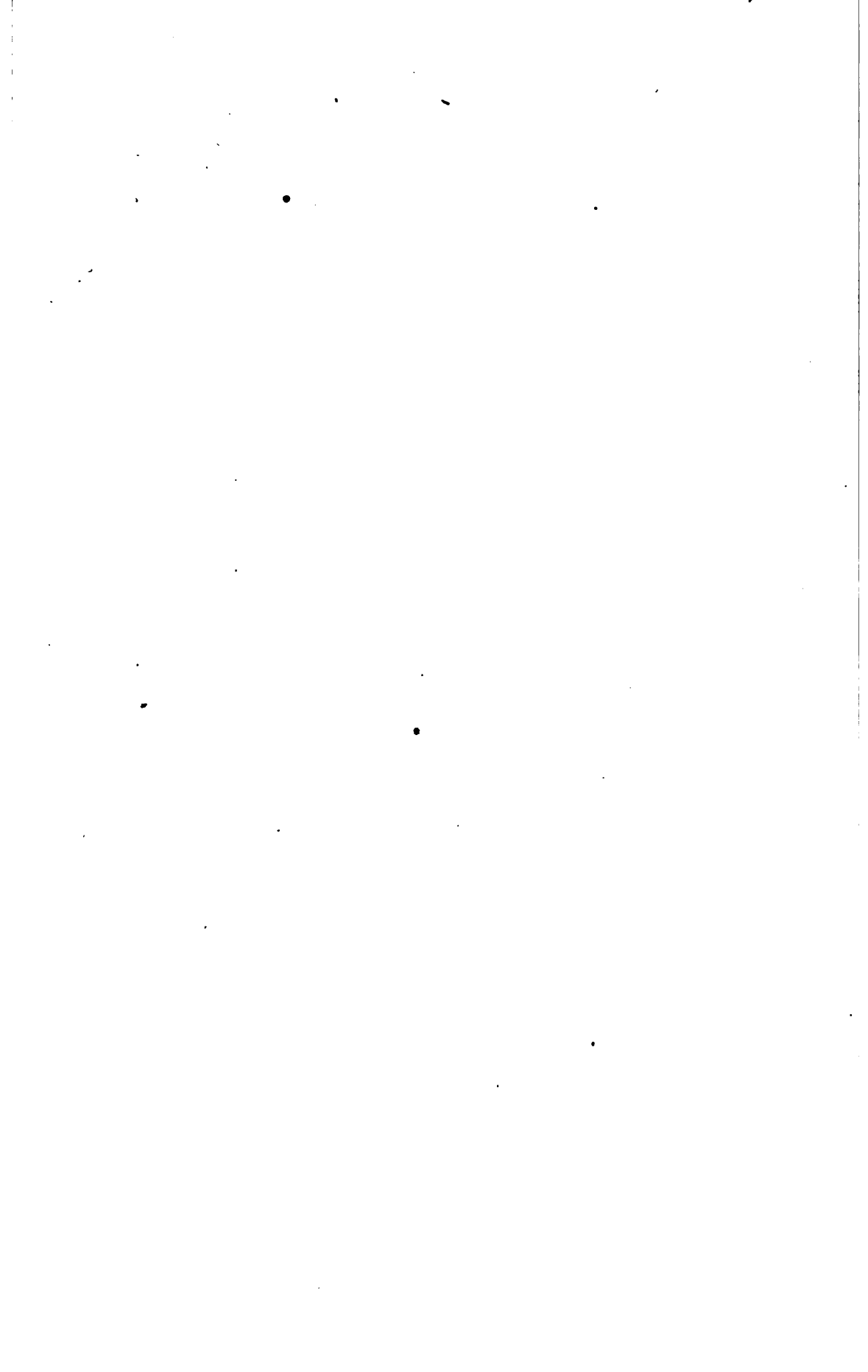
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NEW
AMERICAN CYCLOPÆDIA.

VOL. XI.
MACGILLIVRAY-MOXA.



THE NEW
AMERICAN CYCLOPÆDIA:

A



Popular Dictionary

OF

GENERAL KNOWLEDGE.

EDITED BY

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THE

NEW AMERICAN CYCLOPÆDIA.

MACGILLIVRAY

MACGILLIVRAY, ALEXANDER, a chieftain of the Creek or Muscogee Indians, born on the Coosa river near the present site of Wetumpka about 1740, died in Pensacola, Feb. 17, 1798. His father, Lachlan McGillivray, was a Scotchman of good family, who ran away from home when a boy, came to America, and acquired a large fortune by trade with the southern tribes of Indians. His mother was Sehoy Marchand, the half-breed daughter of a French officer who was murdered in 1722, in a mutiny of his own soldiers, while commanding Fort Toulouse, on the Coosa river. Alexander received a good education in Charleston, and was noted as a boy for his fondness for books and literature. His father had intended to educate him for commercial life, and at one time he was placed in a counting-house in Savannah; but having no taste for trade, he returned, on arriving at manhood, to his Muscogee relatives. Here he soon rose to a high position among the united tribes of Creeks and Seminoles, and at the breaking out of the American revolution was their recognized head. During the war of the revolution the McGillivrays, father and son, were zealous adherents of the royal cause, and the former held the rank of a colonel in the British service. He left the country with the British when they evacuated Savannah, and his estates were confiscated. After the war, Alexander McGillivray, in behalf of the Muscogee confederacy, entered into an alliance with Spain, of which government he was made a commissary, with the rank and pay of colonel. The trade of the Creeks, under his influence, was directed to Pensacola, and for several years he baffled the most persevering efforts of the governments of the United States and Georgia to open an intercourse with the Creeks, and obtain a cession of certain disputed lands lying on the Oconee. At length, in 1790, he was induced by Washington to visit New York, where he was received with high honors, and where he eventually signed a treaty yielding the disputed territory. In return for this concession, beside a pecuniary equivalent to the Creeks, McGillivray by a secret article was rewarded with the appointment of agent for the United States, together with the rank and pay of brigadier-general in the army. The provi-

MACGREGOR

sions of this treaty were not acceptable to the Creeks; it diminished the influence of the chief, and he either was or affected to be unable to prevail upon them fully to comply with it. Meantime, however, he continued to retain his chieftainship, and at the same time actually succeeded in obtaining an increase of salary and of authority from the Spanish government. Although engaged in several military expeditions, in concert with the British, during the revolutionary war, he was less distinguished for military talent than for his skill in controlling the wild chieftains under his command, and the adroitness and ability of his conduct in dealing with the agents of more civilized governments. His hospitality and generosity were almost princely. His deportment was that of a polished gentleman; and his published correspondence affords evidence of his intelligence and education, as well as of his skill as a politician. He was a brother-in-law of the famous Le Clerc Milfort, and an uncle of William Weatherford.

MACGILLIVRAY, WILLIAM, a Scottish naturalist, born in the isle of Harris in 1796, died in Aberdeen, Sept. 5, 1862. In 1823 he was appointed assistant professor of natural history in the university of Edinburgh, and subsequently conservator of the museum of the royal college of surgeons. In 1841 he was made professor of natural history in Marischal college, Aberdeen, which office he held till his death. The most popular of his works are: "History of British Birds," "History of British Quadrupeds," and a treatise on "The Flowering Plants and Ferns of Great Britain and Ireland." The queen purchased his MSS. of the "Natural History of Dee-side and Braemar," on account of its being specially illustrative of the vicinity of her highland residence at Balmoral, and caused it to be printed in 1856, and copies of it to be sent to all the societies of natural history throughout her dominions.

MACGREGOR, JOHN, a British statistician and politician, born at Stornoway, Ross-shire, in 1797, died in Boulogne, April 23, 1857. At an early age he was placed in a commercial house in Canada, which gave him opportunities for collecting the particulars of the resources of the country embodied in his work entitled

"British America," which appeared in 1832. On his return to England he was employed on commercial missions to various continental governments, and in 1840 he was appointed one of the two joint secretaries of the board of trade. He became an enthusiastic advocate of free trade measures, and exerted his influence with the late Joseph Hume to cause the appointment in the house of commons of a select committee on the import duties. In 1847 he resigned his office and became a successful candidate for the representation of the city of Glasgow. He established the royal British bank, but lacked the qualifications for the governorship of such an institution, and, to escape the legal investigation which followed its failure, retired to Boulogne, where he died. He was a friend of the historian Sismondi, and dedicated to him his narrative of his tour on the continent ("My Note Book"). He compiled a comprehensive work on the "Progress of America from the Discovery by Columbus to 1846," comprising 8,000 pages, in 2 huge crown 4to. vols. His "Commercial Statistics," in 5 large volumes containing nearly 4,000 pages, appeared between 1848 and 1850, and was followed in 1852 by the first volume of his "History of the British Empire from the Accession of James I.," a work left incomplete at the time of his death.

MACHENRY, a N. co. of Ill., bordering on Wis., drained by Fox and Des Plaines rivers and their branches; area, 470 sq. m.; pop. in 1855, 19,285. The surface is nearly level and the soil fertile. Limestone abounds. The productions in 1850 were 562,269 bushels of wheat, 301,248 of Indian corn, 270,275 of oats, and 45,094 lbs. of wool. There were 3 grist mills, 7 saw mills, 10 churches, and 5,936 pupils attending public schools. The Chicago and north-western, Galena and Chicago union, and Fox river valley and Wisconsin central railroads pass through the county. Capital, Dorr.

MACHIAS, a port of entry and capital of Washington co., Me., on the left bank of the W. branch of Machias river, near its mouth, 151 m. E. by N. from Augusta, and 240 m. N. E. from Portland; pop. in 1850, 1,590. The inhabitants are principally engaged in ship building and the coasting trade. The tonnage of the district, June 30, 1859, was 33,501; for the year ending with that date the arrivals were 4, tonnage 426; clearances 56, tonnage 11,412.

MACHINE, AND MACHINERY. See MECHANICS.

MACILVAINE, CHARLES PETTIT, D.D., an American clergyman, bishop of the Protestant Episcopal church in the diocese of Ohio, born in Burlington, N. J., Jan. 18, 1798. His father, Joseph McIlvaine, was a leading lawyer, and U. S. senator from New Jersey at the time of his death in 1826. He was graduated in 1816 at Princeton, was admitted to deacon's orders, July 4, 1820, by Bishop White, and having labored in Christ church, Georgetown, Md., he received two years later priest's orders from Bishop Kemp of Maryland. In 1825 he became

professor of ethics and chaplain in the U. S. military academy at West Point. In 1827 he became rector of St. Ann's church, Brooklyn, N. Y., where he remained until 1832. He was consecrated bishop of Ohio, Oct. 31, 1832. Bishop McIlvaine has been a large contributor to theological literature. His "Lectures on the Evidences of Christianity," delivered in the New York university in 1831, were published by request of the council, and have gone through 30 editions. At an early period of the controversy arising out of the Oxford tracts, appeared his "Oxford Divinity compared with that of the Romish and Anglican Churches" (8vo., 1841). In 1854 he published a volume of sermons entitled "The Truth and the Life." He has also compiled two volumes of "Select Family and Parish Sermons." In 1853 the degree of D.O.L. was conferred on him by the university of Oxford, and in 1858 that of LL.D. by the university of Cambridge. In 1859 the Rev. G. T. Bedell, D.D., was consecrated an assistant bishop of the diocese.

MACINTOSH, a S. E. co. of Ga., bounded S. E. by the Atlantic ocean, and S. W. by the Altamaha river; area, 550 sq. m.; pop. in 1859, 5,588, of whom 4,224 were slaves. It is drained by the Sapelo river and Jones's and Doctor's creeks. The surface is level and the soil fertile. The productions in 1850 were 84,715 bushels of Indian corn, 53,165 of sweet potatoes, 8,122,919 lbs. of rice, and 520 bales of cotton; there were 2 grist mills, 4 saw mills, 12 churches, and 120 pupils attending school. Capital, Darien.

MACINTOSH, JOHN, a soldier of the American revolution, born in McIntosh co., Ga., died Nov. 12, 1826. With the rank of lieutenant-colonel he had command of the fort at Sunbury, in Liberty co., when it was besieged by Lieut. Col. Fraser, at the head of a considerable body of British troops, who demanded a surrender in an hour's time, threatening, in the event of refusal, to lay the village and surrounding country in ashes. The reply of Col. McIntosh was: "Come and take it;" which the British commander declined to do. At the battle of Brier Creek, March 3, 1779, Col. McIntosh displayed great bravery. With Gen. Elbert he stood his ground until nearly every man around him had been shot down. On surrendering his sword, a British officer attempted to kill him, but was prevented by Col. Aeneas McIntosh of the British army. After the close of the war he removed to Florida, and settled on the St. John's river. Here he was suddenly arrested by a band of Spanish troops and imprisoned in the fortress of St. Augustine, on suspicion of having designs against the Spanish government, and was finally sent to the captain-general of Cuba, and by him incarcerated in the Moro castle at Havana. After nearly a year's imprisonment, he was released, and returned to Georgia, not, however, until he had aided in destroying a fort on the St. John's opposite Jacksonville, and done the Spanish government some other injuries. In the war of 1812 he again took up arms against

the British, and did efficient service.—JAMES S., an American soldier, son of the preceding, born in Liberty co., Ga., June 19, 1787, died in the city of Mexico in 1847. He entered the army in 1812 as a lieutenant, and was attached to the rifle regiment, with which he served in Canada and on the northern frontier. In May, 1814, he aided in cutting off supplies intended for some British ships building at Sackett's Harbor. He subsequently received a severe gun-shot wound in defending the hospitals at Buffalo. He served with Gen. Jackson throughout the Indian war, for a considerable time commanding Fort Brooke at Tampa, Fla. He was afterward stationed at Mobile, at Fort Mitchell, Ga., at several posts in Arkansas, Wisconsin, and Michigan, and finally at Detroit, whence he was ordered to Texas in 1845. He was present at the battles of Palo Alto and Resaca de la Palma, in the latter of which he received a number of severe wounds. He was also at the battles of Contreras, Churubusco, and finally at Molino del Rey, Sept. 8, 1847, where he was mortally wounded at the head of his column.

MACINTOSH, LAOHLAN, a soldier of the American revolution, born at Borlaim, near Inverness, Scotland, in 1727, died in Savannah, Ga., in 1806. His father, John More McIntosh, with 180 highlanders, came to Georgia with Gen. Oglethorpe in 1733, and settled in the lower part of the state, at the place now known as Darien, but called by them Inverness. Here young McIntosh gathered from his mother, an educated woman, the ordinary branches of an English education, with mathematics and surveying. In the latter studies he received great assistance from Oglethorpe himself. He became afterward a clerk in a counting house at Charleston, where he remained until called on to take command of the first regiment organized in Georgia. Subsequently 8 regiments were raised, and he was appointed a brigadier-general. In 1777 he fought a duel near Savannah with Button Gwinnett, who died 12 days afterward from wounds received in the combat. Gen. McIntosh now accepted a command in the central army under Washington. He was selected by Washington to conduct a campaign against the Indians in the West, and with a small force succeeded in restoring peace on the frontier. In 1779 he repaired to the South and took command of the Georgia troops at Augusta, whence he subsequently marched to Savannah, in the siege of which place he commanded the 1st and 5th South Carolina regiments, and bore an active part. After the fall of Savannah, he retreated to Charleston, and was present there when the city surrendered to Sir Henry Clinton, May 12, 1780. He remained a prisoner of war for a long time, and never resumed his command, but was a member of congress in 1784, and a commissioner to treat with the southern Indians in 1785.

MACINTOSH, MARIA J., an American authoress, born in Sunbury, Ga., in the early part of the present century. She is descended from

a family of Scottish Jacobites, who for their adherence to the old pretender were compelled in the first half of the last century to emigrate to Georgia. About 1835 she removed permanently to New York; and having suffered pecuniary reverses soon after, she resorted to her pen as a means of support, publishing in 1841 her first tale, "Blind Alice," under the pseudonyme of "Aunt Kitty," by which she continued subsequently to be known. It was followed by "Jessie Graham," "Florence Arnott," "Conquest and Self-Conquest," "Praise and Principle," and other tales published between 1841 and 1846, each of which was designed to inculcate some moral sentiment. In 1846 she published a work entitled "Two Lives, or to Seem and to Be," and in the succeeding year her stories were collected in a single volume. Her remaining works are: "Charms and Counter-Charms" (1848); "Donaldson Manor" (1849); "Woman in America" (1850); "The Lofty and the Lowly" (1853), a picture of life on a southern plantation; "Violet, or the Cross and the Crown" (1856), and others.

MACK VON LEIBERICH, KARL, baron, an Austrian general, born at Neuslingen, Franconia, Aug. 25, 1752, died in St. Pölten, Oct. 22, 1828. He rose from humble life to a high position in the army, served in Turkey under London, and against France in the Netherlands in 1792-'3. Appointed in 1798 generalissimo of the Neapolitan troops, he was defeated by MacDonald and Championnet, and incurring the suspicion of the Neapolitans, gave himself up to the French generals, by whom he was sent as prisoner to Paris, but made his escape and was appointed to a new command in S. W. Germany in 1805. Although able in the war office, and popular with the soldiers, he was wholly deficient in the qualities of a commander in the field. He was devoted to the Austrian nobility, who treated him with the utmost contempt on account of his plebeian origin. The consequence of placing a man of his mediocrity against the greatest military genius of modern times became evident when Mack, surrounded by Napoleon's armies, surrendered the fortress of Ulm (Oct. 17, 1805) with a garrison of about 24,000 men. "On the morning of Oct. 20," says Schlosser, "the French exhibited the spectacle of a triumph at Ulm, which had a more powerful influence on the subsequent undertakings during the war than any species of reward could have produced; the Austrians, among whom were 18 generals, marched past Napoleon, laid down their arms before the conqueror, deposited 40 stands of colors at his feet, and delivered up 60 pieces of artillery." Mack was sentenced to death by an Austrian court martial; his sentence was commuted to perpetual imprisonment, and he was set free after 2 years' detention. He was deprived, however, of all his honors and dignities, and was not pardoned till 1819.

MACKAY, CHARLES, LL.D., a British author, born in Perth in 1812. He was partly educated in Brussels, and after returning to

England, published a volume of poems. In 1834 he became attached to the staff of the "Morning Chronicle" newspaper, and so remained for 9 years, writing during the time another volume of lyrics, the principal of which is "The Hope of the World." In 1844 he became editor of the "Glasgow Argus," but relinquished this post in 1847. During the previous year he had received from the university of Glasgow the degree of LL.D., and also published a work on the "Education of the People," a collection of poems which had originally appeared in the London "Daily News," and "Scenery and Poetry of the English Lakes." In 1848 he returned to London, where he published in the same year "Town Lyrics and other Poems." In 1849 appeared his "Bottle," a series of sketches illustrated by George Cruikshank, a work which attained great popularity. In 1858 he made a tour through the United States, where he delivered lectures on the subjects of song-writers and poets. He addressed from the United States a series of letters to the "Illustrated London News," with which journal he had been connected for some time previous to his departure. These letters afterward appeared in a volume entitled "Life and Liberty in America." Among his other works are: "Egeria, or the Spirit of Nature and other Poems" (London, 1850); "Longbeard, or the Revolt of the Saxons," a romance (3 vols. 8vo., 1850); "Memoirs of Extraordinary Popular Delusions" (2 vols. 8vo., 1851); "The Salamandrines" (1853), his longest poem; "The Lump of Gold," the "Songs of the Brave," and "Under Green Leaves" (1856); and "A Man's Heart" (1860). Many of Mr. Mackay's songs have attained great popularity, and the music to which they are set is in some cases of his own composition. In July, 1860, he established the "London Review," a weekly journal of politics, literature, art, and society.

MACKEAN, a N. co. of Penn., bordering on N. Y.; area, 1,142 sq. m.; pop. in 1850, 5,554. It is drained by the Alleghany river and branches, by the sources of the Clarion river, and numerous creeks. The surface is hilly, the soil of slate and shale formation, and it abounds with coal, iron, and salt. The productions in 1850 were 10,172 bushels of Indian corn, 29,974 of oats, and 9,657 lbs. of wool. There were 2 grist mills, 38 saw mills, 1 iron foundry, 5 churches, and 972 pupils attending schools. Capital, Smithport.

MACKEAN, THOMAS, an American jurist and statesman, and a signer of the declaration of independence, born in Chester co., Penn., March 19, 1734, died June 24, 1817. In 1765 he was elected a member of the Pennsylvania assembly, to which he was annually returned for the next 17 years. In 1765 he attended the general congress of the colonies which assembled at New York, and formed one of the committee who framed the address to the British house of commons; and in the same year he was appointed judge of the court of common

pleas for Newcastle county. In Sept. 1774, he took his seat in the first continental congress, as a delegate from the lower counties in Delaware, and continued to discharge the duties of that office until Feb. 1783, being the only member who served during the whole revolutionary period without interruption. In 1781 he was elected president of congress. He was an energetic whig, and was active in urging the adoption of the declaration of independence. While occupying a seat in congress from Delaware he was in 1777 appointed chief justice of Pennsylvania, and in the same year he also officiated as president of the state of Delaware, for which he drew up a constitution. He was chief justice of Pennsylvania until 1799, when he retired from the bench on being elected governor of the state. His administration lasted until 1808, when he withdrew definitively from public life. As a jurist he held a high position for integrity, impartiality, and learning. In politics he was one of the leaders of the republican party, the ascendancy of which in Pennsylvania was in no small degree owing to his exertions.

MACKEEVER, ISAAC, a commodore in the U. S. navy, born in Pennsylvania in April, 1793, died in Norfolk, Va., April 1, 1856. He entered the navy as a midshipman in Dec. 1809, was made a lieutenant in 1814, and commanded one of a flotilla of 5 gun boats under the command of Lieut. Thomas ap Catesby Jones, which was captured by a British expedition upon Lake Borgne, La., in Dec. 1814. The gun boats mounted, collectively, 28 guns, and were manned by 182 men. The British expedition consisted of 42 large barges and other boats, manned by over 1,000 seamen and marines. The engagement, which was very severe, lasted more than 8 hours, and over 200 of the British were killed and wounded. Lieut. McKeever's vessel was the last one attacked, and he was severely wounded, together with most of his officers, before he surrendered. He became a commander in May, 1830, and a captain in Dec. 1838, performing much active service in both grades. He commanded the squadron on the coast of Brazil from 1851 to 1854. In 1855 he commanded the navy yard at Norfolk, Va., when a terrible pestilence broke out in that city and the adjacent towns. He was authorized by the navy department to suspend the operations of the establishment, and leave it for a time if he saw fit; but he decided to remain, that work might be afforded in the navy yard to those who had no other means for the support of their families.

MACKENDREE, WILLIAM, an American clergyman, bishop of the Methodist Episcopal church, born in King William co., Va., July 5, 1757, died March 5, 1835. He joined the patriot party in the American revolution, and rose to the rank of adjutant in the army. During a season of remarkable religious interest in Virginia in 1787, he resolved to enter the ministry, joined the Methodist conference, and at the expiration of 4 years was ordained an elder. He

was appointed to several offices of importance and trust, was one of the delegates of the first general conference which elected its members, and was afterward made presiding elder of a new conference in what was then the far West, comprising Ohio, Kentucky, Tennessee, and parts of Virginia and Illinois. He had but 18 assistants to labor in these wide fields, but his zeal, eloquence, and great physical strength enabled him to discharge his functions with wonderful success. On May 12, 1808, he was chosen bishop. During the first year he was almost continually with Bishop Asbury, visiting nearly all parts of the United States and a part of Canada. Until the last year of his life, despite old age and bodily infirmities, Bishop McKendree attended the conferences, travelling when he could no longer sit up in the carriage, and sometimes carried in an almost fainting condition into the house.

MAOKENZIE, SIR ALEXANDER, a Scottish traveller, born probably in Inverness, died in 1820. He emigrated to Canada when a young man, and obtained a situation in the counting house of Mr. Gregory, one of the partners in the north-west fur company. In 1789 his employer determined to send him on an exploring expedition through the regions of the north-west, and in the summer of that year Mackenzie set out from Fort Chippewyan, on Lake Athabasca, where he had been stationed for 8 years, with 4 canoes and a party of 12 persons, to accomplish this mission. For 6 weeks he threaded his way along the rivers and lakes of British America, till he reached the great northern ocean in lat. 69°. Having returned to Fort Chippewyan, he started in Oct. 1792, to explore the country toward the Pacific, reaching that ocean July 23, 1793, and regaining in safety the point of departure. He published a detailed account of these explorations, under the title of "Voyages from Montreal, on the River St. Lawrence, through the Continent of North America, to the Frozen and Pacific Oceans, in the years 1789 and 1793" (London, 1801). In consideration of his services he received the honor of knighthood in 1802; and the river by which he had descended from Slave lake to the Arctic ocean was called after him.

MAOKENZIE, ALEXANDER SLIDELL, a commander in the U. S. navy, born in New York in April, 1808, died in Tarrytown, N. Y., Sept. 13, 1848. His name was originally Slidell; that of Mackenzie, the name of his mother, was added to his own in 1837, at the request of a maternal uncle. He entered the navy as a midshipman in Jan. 1815, and made his first cruise to the Mediterranean in the frigate Java, commanded by Capt. Oliver H. Perry. In Jan. 1825, he was promoted to the rank of lieutenant, and in Sept. 1841, to that of commander, in both which grades he performed much active service in the Mediterranean, West Indies, the Brazilian waters, and the Pacific, and was distinguished as an accomplished and zealous officer. In 1842 he commanded the brig Somers of 10 guns, manned

chiefly by naval apprentices; and on his passage from the coast of Africa in the autumn of that year, the existence of a mutinous plot on board was discovered, the principals of which were immediately placed in close confinement. A council of officers was called, which, after a careful investigation, decided that the conspiracy had already attained a formidable growth; and as the mutinous spirit evidently increased, even while the investigation was in progress, the immediate execution of the three persons principally implicated was recommended. This recommendation was carried into effect at sea, Dec. 1, 1842. The Somers soon afterward arrived in New York, when a court of inquiry, composed of Commodores Stewart, Jacob Jones, and Dallas, was immediately ordered to investigate the affair. The result was a full approval of the conduct of Mackenzie. Subsequently, a court martial was held upon him at his own request, of which Commodore John Downes was president, and the trial, which occupied over 40 days, resulted in his acquittal. Mackenzie was the author of several works of merit. His first book, "A Year in Spain," which appeared in 1829, was received with great favor both in Europe and America. His subsequent works were a series of popular essays on naval subjects, "The American in England," "Spain Revisited," a revised edition of the "Year in Spain" published in 1836, and biographies of Com. O. H. Perry, Stephen Decatur, jr., and John Paul Jones, the latter being a contribution to Sparks's "American Biography."

MAOKENZIE, DONALD, an American merchant, born in Scotland in 1783, died in Maysville, Chautauque co., N. Y., Jan. 20, 1851. He emigrated to Canada in 1800, and, after being employed for several years in the service of the north-west company, became in 1809 a partner with John Jacob Astor of New York in his project for establishing a trade in furs west of the Rocky mountains. He travelled across the continent to the mouth of the Columbia river, an undertaking then surrounded with perils, and remained at Astoria until the surrender of the place to a British force in 1814; when, having converted whatever he could into available funds, he again traversed the wilderness to the Mississippi, reaching New York in safety. He was subsequently unsuccessfully employed in negotiations to secure to the United States the exclusive trade with Oregon; and in 1821 he entered the service of the Hudson's Bay company as member of the council and chief factor. He retired in 1832 with a fortune, and settled in Maysville.

MACKENZIE, HENRY, a Scottish author, born in Edinburgh in Aug. 1745, died there, Jan. 14, 1831. He was educated at the high school and university of Edinburgh, prepared himself for practice in the court of the exchequer, studying the English exchequer practice in London in 1765, and ultimately became attorney for the crown in Edinburgh. While in London he began his first and best novel, "The

Man of Feeling," which was published anonymously in 1771. Its popularity induced a Mr. Eccles of Bath to lay claim to the authorship, and to support his pretensions by a copy transcribed in his own hand, with interlineations and corrections. It became necessary, therefore, for Mackenzie to acknowledge himself the author through a formal statement by his publishers. He was an ornament of the literary circles of Edinburgh, which then included Hume, Robertson, Adam Smith, and Blair, his professional duties allowing him leisure both for literature and society. His second novel was "The Man of the World" (1788), the hero of which grasps at happiness in defiance of the moral sense, ruins himself, and afflicts his friends; while the hero of the former, with almost excessive purity and delicacy of mind, is characterized only by fine and generous sentiments. The last of his longer novels was "Julia de Roubigné," in a series of letters, marked even more than the others by pathos and melancholy. He had previously been one of a society of literary lawyers in Edinburgh, by whom a series of papers, modelled after the "Spectator," had been projected. He was the editor of the "Mirror," which appeared once a week for 17 months from Jan. 1779, to which he contributed 42 papers; and of the "Lounger," which continued for about two years from Feb. 1785, to which he furnished 57 papers. In the former he published his "Story of La Roche," and in the latter he was the first to appreciate the poems and genius of Burns. He was one of the original members of the royal society of Edinburgh, to the "Transactions" of which he furnished a memoir on German tragedy, highly commending the "Emilia Galotti" of Lessing and the "Robbers" of Schiller. For the highland society he wrote a "Report on the Ossianic Controversy," against the genuineness of the poems. In 1793 he prepared a life of the blind poet Blacklock for an edition of his works; and in 1812 he read before the royal society a life of Home, the author of "Douglas," which sketched the literary society of Edinburgh during the latter part of the last century. He was likewise the author of political tracts in the tory interest, and in 1804 received the lucrative appointment of comptroller of taxes for Scotland, which he held till his death. His collected works (8 vols., 1808) contain 8 tragedies, two of which had been previously performed. He passed his last years in the society of friends, enjoying his favorite sports of shooting and fishing, and occasionally writing on matters of taste; for, he said, "the old stump would still occasionally send forth a few green shoots."

MACKENZIE, ROBERT SHELTON, D.C.L., a British and American journalist, born in Drew's Court, Limerick co., Ireland, June 22, 1809. He was educated at a school in Fermoy, where his father, originally an officer in the British army, occupied the position of postmaster; and at the age of 18 was apprenticed to a

surgeon apothecary in Cork, with whom he remained 3 years. After passing his medical examination he opened a school in Fermoy, and in 1829, having already had some experience as a newspaper reporter, he became the editor of a country journal published in Staffordshire, England. In 1830-'31 he was employed in London in writing biographies for a work called the "Georgian Era," and in revising the contributions of others; and for a number of years subsequent he acted as editor of a variety of newspapers, including the "Liverpool Journal." Between 1834 and 1851 he was the English correspondent of the "New York Evening Star," beside contributing extensively to various American periodicals. In 1845 he became editor and part proprietor of a railway journal in London, and in 1847 was an active member of Lord Brougham's law amendment society. In the latter part of 1852 he arrived in New York, where for several years he was a writer for several of the principal journals; and in 1857 he became literary and foreign editor of the "Philadelphia Press," a position which he still holds. In addition to his labors as a journalist, he has been a prolific author of original works and compilations, extending from 1829 to the present time. Among these are: "Lays of Palestine" (1829); "Titian," an art novel, the scene of which is laid in Venice (8 vols. 8vo., 1843); "Partnership en Commandité," a legal and commercial treatise on the advantages of that system (8vo., 1847); "Mornings at Matlock" (3 vols. 8vo., 1850), a collection of fugitive magazine pieces; Sheil's "Sketches of the Irish Bar" (New York, 1854), with memoirs and notes; an edition of the "Noctes Ambrosianæ," with sketches of the principal contributors and numerous notes (5 vols. 12mo., New York, 1854); "Bits of Blarney" (12mo., 1855); an edition of Curran's life by his son (12mo., 1855); one of Dr. William Maginn's writings (5 vols. 12mo., 1855-'7), and others. Among his latest publications are: "Tressilian and his Friends" (12mo., 1859), and an edition of the "Memoirs of Robert Houdin" (1859).

MACKENZIE RIVER. See HUDSON'S BAY TERRITORY, vol. ix. p. 325.

MACKEREL, a well known acanthopterygian fish of the scomberoid family, and one of great utility to man, from its countless numbers and excellence as food. This family includes also the bonito (see BONITRO) and its allied forms, the tunny, the pilot fish, and the sword fish. The scales are small, delicate, and smooth, the bones light, the tail slender, and gill covers unarmed; the first dorsal fin continuous, the rays of the second and of the anal detached, forming finlets, and with a large interval between the dorsals; the body is fusiform, the caudal fin powerful, the tail usually with a slight keel on the side, the vertical fins without scales; a row of small conical teeth in each jaw; branchiostegal rays 7; most of the species have no air bladder. The common European mackerel

(*scomber scombrus*, Cuv.), so well known for the beauty and brilliancy of its colors and the elegance of its form, has a pointed nose, the under jaw the longer, the gill covers large and smooth, the pectorals and ventrals in advance of the dorsal, the former the most anterior, 5 finlets above and below the tail, vertically over each other, and the tail crescent-shaped; the color above the lateral line is fine green varied with blue, and marked with broad, descending, undulating, dark lines; the lower parts are silvery with golden tints. According to Anderson, the mackerel performs migrations almost as extensive as the herring; it probably inhabits almost every part of the European seas, and comes into shallow water at particular seasons to breed; were it not for these periodical visits, no effective fishery could be carried on, as it would be impracticable to follow the shoals over the ocean; great as is the number caught, it is very small compared with those which escape. It is caught on the shores of Great Britain from March to June, spawning in the latter month; the young, called shiners, are 6 inches long by the end of August; in winter they retire to deep water, though a few are taken on the Cornish coast all the year round; as many as 500,000 eggs have been counted in a single female. The mackerel is very voracious, feeding principally on the fry of other fish; it grows rapidly, and attains an average length of 15 inches, and a weight of 2 lbs., though some considerably exceed this. It is considered better in May or June than earlier or later in the season; the flesh rapidly becomes soft, and must be eaten soon after being taken from the water; much of the flavor, however, is retained in the salted fish. The mackerel season is a very busy and profitable one on the British coasts, a single boat's crew sometimes gaining £100 in a night's fishing. They are taken in large quantities by drift nets, reaching about 20 feet below the surface, and extending for more than a mile; these are set in the evening, and the fish, roaming at night, are caught in the meshes and retained by the pectoral fins; they are caught also in seines and by trawling. The mackerel will bite at almost any bait, especially any thing resembling a living prey, and will even dart at a piece of red cloth or leather; it generally takes the hook not far below the surface. The Spanish mackerel (*S. colias*, Gmel.), found abundantly in the Mediterranean, occasionally upon the French and English coasts, and perhaps even in American waters (though a different species from that commonly known here by that name), is about as large as the last, with larger scales, and with the dark undulations of the back more complicated and the whole surface more or less spotted with gray; it has an air bladder, which the common species has not; it is far inferior also as an article of food. Mackerel of these and many other species, described in ichthyological works, are found in all the northern seas from Greenland to the Mediterranean, in the Black sea and that

of Azof, and in the waters of Australia, the East Indies, the Cape of Good Hope, the North Atlantic, and the American coasts; they have everywhere, and from remote antiquity, maintained a high rank as an article of food. Not only man, but many species of cetaceans and fish, prey upon the mackerel; among their greatest enemies in our waters are the horse mackerel or tunny and the blue fish. From the perishable nature of their flesh, it is permitted in many English seaports to cry them in the streets on Sundays.—The common mackerel of our coast is the *S. vernalis* (Mitch.), of a dark green color above, with beautiful undulations of a darker color extending below the lateral line; the top of the head is dark, almost black, and a large black blotch extends backward from the occiput to the gill covers; behind the eyes cupreous; gill covers silvery, sides white with cupreous reflections, and abdomen white; beneath the lateral line is a fuliginous line, often interrupted, extending the whole length of the fish. The fins and finlets are much like those of the European species. This mackerel is caught in the waters of Massachusetts bay from the 10th of May through the summer, in some seasons in great quantities and in others hardly at all; most of the first comers are males, large but lean, and when cured are ranked as No. 3; these are taken in nets in the vicinity of Provincetown, this mode of fishing lasting for a month or 6 weeks. After the spring visit they return in the autumn, but are then usually taken in smaller quantities. Mackerel are inspected before they are barrelled, and are divided into 4 distinct qualities; No. 1 includes those over 18 inches long; No. 2, those under this size, but fat; No. 3, those 13 inches long, but poor; and No. 4, such as are less than 13 inches, and poor. After July 1 they will generally take the hook, but sometimes from unexplained causes not a fish of countless numbers will bite; indeed, no other fishery of late years, near the shore, has been so capricious and uncertain, either because the fish have found food in abundance elsewhere, or have been terrified by some of their numerous enemies. From 8,000 to 10,000 barrels are sold fresh in Boston market every year, and from 200,000 to 300,000 are annually inspected in Massachusetts, which are worth about \$1,500,000; the number caught varies greatly from year to year, from the causes above alluded to. In some years the number of vessels from Massachusetts alone engaged in this fishery has been nearly 1,000, employing in the various processes of catching, salting, and packing more than 5,000 persons. The smaller specimens, or tinkers, and various other fishes, are ground up for bait, which is allowed to become rotten, and in this strong-smelling state is scattered on the surface of the water in order to attract the shoals. A large proportion of the poorest quality is exported to the East and West Indies and to South America; the better qualities find a ready market in New York, Philadelphia, and cities further south, and especially in the slave-

holding states. Mackerel are caught in great quantities along the coast of the British provinces; in 1857, in Nova Scotia alone, nearly 86,000 barrels were inspected, and in some years the number has been much greater.—The fish called Spanish mackerel on our coast, *S. Dekayi* (Storer), much resembles the European *S. colias* (Gmel.), but is more robust, with more numerous spots, and with an interrupted dull brown band beneath the lateral line, extending from beneath the pectorals in a straight line to the tail. It is far less common than the *S. vernalis*; it is generally fat, and is regarded by epicures as a superior fish for the table; its usual weight is somewhat less than a pound. Another scomberoid belonging to the genus *cybium* of Cuvier (*C. maculatum*, Cuv.) is also called the Spanish or spotted mackerel; the body is elongated, but without the pectoral corslet of the tunny; there is an elevated crest on each side of the tail, and a smaller one above and below it; the teeth are large, compressed and sharp, short and even on the palate bones. The length is about 20 inches; the color above is dark leaden, lighter on the sides; the jaws, gill covers, and abdomen clear white, with a satin lustre; the dorsal ridge dark green; 20 or more circular or oblong spots on the sides above and below the lateral line, most of them above the line and anterior to the 2d dorsal; the membrane of the 1st dorsal black, the 2d leaden, pectorals black below and light above, and the ventrals white; the rays of the 1st dorsal project beyond the membrane; the 2d dorsal triangular, emarginated behind; there are 8 or 9 finlets between the caudal and the 2d dorsal and the anal. It extends from South America as far as the coast of Maine, and is esteemed as food; it was more common than usual during the summer of 1859 in the waters of New York, Connecticut, and Massachusetts.

MACKAY, ALBERT GALLATIN, an American physician and author, born in Charleston, S. C., in 1807. He obtained by teaching school the means of preparing himself for the medical profession, and was graduated at the medical college of South Carolina in 1832, obtaining for his Latin thesis *De Gastridite* the first honors and a prize. For 5 years he practised medicine in the parishes of St. Paul and St. Bartholomew, S. C., when he married and settled at Charleston. In 1838 he was elected demonstrator of anatomy in the medical college of South Carolina. In 1844 he abandoned his profession from a strong taste for letters, and a passion for the study of symbolism and the occult sciences, and divided his time between miscellaneous writing and freemasonry. He was connected with the "Literary Bulletin," "Southern Patriot," "Evening News," and other periodicals of Charleston. In 1850 he established a masonic monthly, which was maintained almost solely by his own pen for 8 years. In 1858 he established a "Quarterly" devoted to the same interests, which he continued for 2 years. He acquired almost unaided the Greek, Latin, Hebrew, and most of the continental languages. He has lec-

tured much upon the temperaments, the influence of organization upon mind, and the intellectual and moral development of the middle ages. Latterly, he has devoted his attention more exclusively to his favorite study of abstruse symbolism, which has led him to cabalistic and Talmudic researches; and he is now preparing an elaborate work on symbolism. His published writings, beside contributions to periodicals, are: a "Lexicon of Freemasonry" (Charleston, 1845), a standard work among masons; "The Mystic Tie" (Charleston, 1849); "Principles of Masonic Law" (New York, 1856); "Book of the Chapter" (New York, 1858); and "Text Book of Masonic Jurisprudence" (New York, 1859). Most of these have already passed through several editions, and are of high authority in England and America.

MACKIE, JOHN MILTON, an American author, born in Wareham, Mass., in 1818. He was graduated in 1839 at Brown university, where he was tutor from 1834 to 1838, and subsequently travelled in Europe. In 1845 he published a "Life of Godfrey William von Leibnitz," and in 1848 contributed to Sparks's "American Biography" a "Life of Samuel Gorton." In 1848 appeared his "Cosas de España, or Going to Madrid via Barcelona." Mr. Mackie is known as a contributor to the "North American Review" of a number of articles on various subjects, principally on German literature and history. He has also written a "Life of Schamyl, the Circassian Chief" (Boston, 1856), and "Life of Tai-Ping-Wang, Chief of the Chinese Insurrection" (New York, 1857).

MACKINAW. See MICHILIMACKINAW.

MACKINTOSH, SIR JAMES, a British statesman and philosopher, born in Aldourie, near Inverness, Scotland, Oct. 24, 1765, died in London, May 22, 1832. His father, the proprietor of a small estate, the inheritance of his family for more than two centuries, served 24 years in the army, and was severely wounded in the battle of Frelinghausen in the 7 years' war. James was educated with great care by his mother, who lived with her mother and sisters, until at the age of 10 he was sent to school at Fortrose. "The only infant in a family of several children," he writes in his autobiographical sketch, "they rivalled each other in kindness and indulgence toward me, and I think I can at this day discover in my character many of the effects of this early education." He already evinced that predilection for abstract speculation which distinguished his intellectual character, an interest in theological controversy being his inducement, as he remarks it has been the general inducement of individuals and nations, to prosecute metaphysical inquiries. The study of Bishop Burnet's commentary on the 17th Anglican article led him to ponder the subject of predestination, and at the age of 14 he adopted the doctrine of the freedom of the will. His autobiography shows his singular interest at this time in Roman and Byzantine history, his habit of various and desultory read-

ing, and his proneness to reverie. He was regarded as a prodigy of learning, was employed at school to teach what he knew to the younger boys, and had become a prolific versifier when in 1780 he entered King's college, Aberdeen, where he remained till 1784, passing his vacations in the house of his grandmother. One of the works which he read out of course was Warburton's "Divine Legation," to which in part he ascribes his fondness for "the twilight of historical hypothesis," and his passion for investigating the rise, progress, and decline of opinions. Of his fellow students, Robert Hall, his senior by one year, was the one whose society and conversation had most influence on his mind. In Greek, Hall preferred Plato and Mackintosh Herodotus, and in their walks they were often pointed out as "Plato and Herodotus." But their most common subjects of disputation were the abstruse questions of morals and metaphysics. For months and even for sessions in succession they debated every important position in Berkeley, Butler, and Edwards, each cordially acknowledging through life his obligations to the other. Under their auspices a society was instituted of which they were the centres of attraction, which was jocularly designated "the Hall and Mackintosh club." Mackintosh left Aberdeen with literary ambition and with a preference for the legal profession, but his father's fortune was too small for him to venture on so uncertain a pursuit. His eagerness for books suggested bookselling as an eligible occupation, and he was always of opinion that a highly educated man of moderate fortune would find the life of a bookseller in London very agreeable. His deliberations terminated in the choice of medicine, in which he began his studies in Edinburgh in Oct. 1784. Surrounded by intellectual celebrities, his attention was engrossed rather by speculation than study—medicine, metaphysics, politics, and literature contributing almost equally to his general culture. He became president of the academic royal medical society, "then divided into Cullenians and Brunonians, the Catholic church and the heretics," and was one of the most zealous supporters of Brunonianism. He was also a member and a prominent speaker of the celebrated speculative society, among the leaders of which at that time were Benjamin Constant and Thomas Addis Emmet. Three years were thus spent in a university, than which, he says, it is not easy to conceive one "where industry was more general, where reading was more fashionable, where indolence and ignorance were more disreputable." Having obtained his diploma, he set out for London, arriving there in a period of intense political excitement. He found debate in political clubs, the eloquence of Burke and Sheridan at the trial of Hastings, and the charms of society far more congenial to his tastes than the life of a medical practitioner. He contemplated a professional establishment in St. Petersburg, but the project was abandoned. Other schemes failed. While his plans were

thus undetermined, and he felt the pressure of pecuniary difficulties, he married a young lady without fortune, and found himself at the age of 24 with no prospect of professional settlement, with his property rapidly diminishing, and with a wife. The malady which attacked the king in 1788, and largely occupied the public attention, led him to advertise a work on insanity, a considerable portion of which was written, but which was never published. During the struggle concerning the regency he made his first public appearance in politics, the field then most congenial to his thoughts, by writing a pamphlet in support of Mr. Fox. In 1789 he made a tour with his wife through the Netherlands to Brussels, and on his return to London he contributed articles on the affairs of Belgium and France to the "Oracle" newspaper, which led to his superintendence of the foreign department of that journal. From this period dates his resolution to study law and change his profession. After exercising his powers as a writer for the newspaper press, and cultivating them again in retirement, the irreconcilable sobriety which rent the whig party of England furnished the occasion for the first public demonstration of his abilities. Mr. Burke's "Reflections on the French Revolution" thoroughly aroused the public mind, and was generally received with enthusiasm by the better educated classes, and with indignation by those who favored the French principles of liberty. Numerous replies were immediately published and forgotten, Thomas Paine alone having answered him with nearly equal strength, but with too much coarseness and dogmatism to attract those most influential in society. In the *Vindicia Gallica* (April, 1791) Mackintosh appeared as the apostle of liberalism, with a sobriety, a command of moral and political science, an amiability of feeling, and a beauty of style and illustration which placed him at once in the front rank of the party which was upholding the cause of France. This work enjoyed the praise of both Fox and Burke, his acquaintance was sought by the most eminent whigs of the day, the highest hopes were conceived of him, and upon the formation of the association of the friends of the people he became its secretary, in which semi-official character he defended its principles in a letter to Pitt. Applying himself more particularly to legal studies, he was called to the bar in 1795, and attached himself to the home circuit. But the technicalities of the law were distasteful to his generalizing and philosophical mind, and exursive reading and occasional contributions to periodicals divided his attention, when in 1797 he suffered a severe affliction in the loss of his wife. "She gently," he wrote, "reclaimed me from dissipation; she propped my weak and irresolute nature. . . . To her I owe whatever I am; to her whatever I shall be." For several years he devoted himself with more concentration of thought and purpose than at any other period of his life to the study of general or international law, in which his mind

found opportunity to delight itself with general principles. It was a subject also in which current events tended to excite an interest. In 1799 he formed the plan of a series of lectures upon the law of nature and of nations, for which the benchers of Lincoln's Inn granted him the use of their hall. The introductory discourse met with instant and brilliant success. It was published, read, and commended by men of all parties, and would alone be a remarkable monument of intellectual breadth and strength. The lectures were twice delivered in successive years before audiences of a distinction unrivalled on any similar occasion; and the ostentatious support of the ministry, in consequence of the widely different view which he took of the French revolution from that which appeared in the *Vindicta Gallica*, tended to alienate from him the prominent men of his own political party. "The opposition," he said, "mistook the moral character of the revolution; the ministers mistook its force; and both parties, from pique, resentment, pride, habit, and obstinacy, persisted in acting on these mistakes after they were disabused by experience." The reputation which his lectures conferred favored his professional advancement, and for a few years he was chiefly occupied with legal practice. His forensic reputation was raised to its highest point by his effort as counsel for Peltier (Feb. 21, 1808), accused of libel on the first consul of France. "I perfectly approve of the verdict," wrote Erskine, "but the manner in which you opposed it I shall always consider as one of the most splendid monuments of genius, learning, and eloquence." Though Mackintosh held an eminent rank at the bar, his income was not equal to the expenditure required by his social position and habits, since he had married a second time. His eagerness, also, to secure a period of leisure for the gratification of his intellectual tastes induced him to seek a professional situation in India; and by the friendly interest of Canning he obtained the recordership of Bombay, and in connection with it the honor of knighthood. During the interval before his departure he met on two or three evenings of every week a small party, anxious to show their respect and to enjoy his conversation, which regularly included Mr. Horner, Mr. Rogers, and the Rev. Sydney Smith. He remained 8 years in India, receiving in 1806 the additional appointment of judge of the admiralty court, and his official conduct won general favor. He had resolved from the beginning to do all in his power to promote the progress of knowledge within the sphere of his influence, and among other means he founded the literary society of Bombay for the investigation of the philosophy, arts, literature, geography, and history of India. He was elected its president, opened its proceedings with an elaborate introductory discourse, prosecuted a wide range of studies, and was consulted by men of talent in every part of India on their literary projects. He returned to England, with broken health, in 1812. He had been to El Dorado, but had forgotten

the gold; and was obliged to confess to his friends that he was ashamed of his poverty, since it showed a want of common sense. Mr. Perceval immediately offered him a seat in parliament with intimations of future advancement, but he declined it on the ground of the implied condition that he should support the ministry, and he also refused appointments in the ministries of Canning and Lord Liverpool. In 1818 he was returned to parliament on the whig interest for the county of Nairn, and retained his seat successively for Nairn and Knareborough during the remainder of his life. Though he held from the first a high place, it was rather from his preeminence on great occasions than from his efficiency in the ordinary business of the house. His style of oratory, rather academic than forensic, was often too elaborate for a busy and impatient assembly. In 1818 he was appointed professor of law in the college at Haileybury, thus for the first time obtaining a station for which he was confident he was by nature best fitted, and discharged its duties with distinguished success till 1824. In 1827, on the coalition of the whigs with Canning, the latter was surprised that the name of Mackintosh was not one of those submitted to him for office. Under Lord Grey's administration in 1830 he became only a member of the board of control, though a seat in the cabinet was generally expected for him. His last great political effort was a speech advocating the reform bill (July 4, 1832). His death, hastened by a slight accident, was perhaps more sincerely and less enviously regretted than that of any other man of his age. Throughout his public life his highest ambition had aimed at the production of works of literature and philosophy. In India he planned a history of England from the reign of James II., which was prosecuted from time to time, though ultimately he changed his scheme and wrote a brief but highly esteemed general survey of English history down to the reign of Elizabeth, forming 3 volumes of Lardner's *Cyclopædia*. Of his larger work only a fragment was posthumously published, containing an account of the revolution of 1688, which Macaulay pronounced decidedly the best history of the reign of James II. For the "Encyclopædia Britannica" he wrote an introductory "Dissertation on the Progress of Ethical Philosophy," the original outline of which his declining health obliged him to compress; and though incomplete and desultory as a whole, it abounds in indications of his peculiar comprehensiveness and justice of thought. The charms of society and of conversational discussion, and the interruptions of public affairs, combined with his constitutional indolence to keep him from continuous and severe study, and to prevent the realization of the brilliant dreams of his youth. His autobiography was abandoned almost at the beginning, and his journal is fragmentary, the long gaps being sometimes marked: *Hiatus vultu defendendus*. He was one of the most honored guests at Holland house, was an

occasional contributor to the "Edinburgh Review," and enjoyed a renown for learning, candor, and conversational brilliancy, which is justified though not adequately represented by his works. "His proper place," says Macaulay, "was his library, a circle of men of letters, or a chair of moral and political philosophy. . . . Whatever was valuable in his compositions was the ripe fruit of study and of meditation. It was the same with his conversation. In his most familiar talk there was no wildness, no inconsistency, no amusing nonsense, no exaggeration for the sake of momentary effect. His mind was a vast magazine admirably arranged; every thing was there, and every thing was in its place. His judgments on men, on sects, on books, had been often and carefully tested and weighed, and had then been committed each to its proper receptacle, in the most capacious and accurately constructed memory that any human being ever possessed." His miscellaneous works, including his contributions to the "Edinburgh Review," have been collected (8 vols., London; 1 vol., Philadelphia). The "Memoirs" of his life by his son (2 vols., London, 1835; Boston, 1858) includes also his autobiography, journal, correspondence, and many fragments and sketches.

MACKLIN, CHARLES, an Irish actor and dramatist, born in Westmeath about 1690, died in London, July 11, 1797. His real name was McLaughlin. At the age of 14 he was apprenticed to a saddler, and soon ran away from his master, and went to England, where he married the widow of a publican. This marriage was speedily dissolved on account of his youth, and Macklin, returning to Ireland, became badgeman in Trinity college, Dublin. In 1711 he again visited England, and joined a strolling company of players in the capacity of harlequin. In 1725 he made his appearance at the Lincoln's Inn theatre, London, as Alexander in "Oedipus;" and in 1741 he established his fame as an actor by his representation of Shylock at Drury Lane theatre. Retiring from the stage in 1753, he turned tavern-keeper and lecturer on oratory in Covent Garden; but this speculation having failed, he returned to the stage in 1758, where he continued with some intervals until 1789, when, in his 100th year, the failure of his powers finally compelled him to abandon it for ever. There is some doubt as to the date of his birth, he himself, to serve a special purpose, as was alleged, placing it in 1699, contrary to the evidence of his contemporaries; but even in that case he presents an extraordinary instance of professional longevity. He was the author of 10 dramas, two of which are still occasionally represented: "The Man of the World," and "Love à la Mode." A memoir of him, by J. T. Kirkman, was published in London in 1799.

MACKNIGHT, JAMES, a Scottish clergyman and author, born in Irvine, Argyleshire, in 1721, died in Edinburgh in 1800. He studied at Glasgow and Leyden, was licensed as a preacher, and in 1753 was appointed minister of Maybole in

Ayrshire, where he continued for 16 years, and composed some of his most valuable works. In 1769 he was transferred to Jedburgh, and in 1772 became pastor of one of the leading churches of Edinburgh, where the rest of his life was passed. His most important works are: "Harmony of the Four Gospels" (4to., 1756; 2d ed., 2 vols. 4to., 1763); "The Truth of the Gospel History" (4to., 1768); and "A New Translation of the Apostolical Epistles, with Commentary and Notes" (4 vols. 4to., 1795).

MACLANE, LOUIS, an American statesman, born at Smyrna, Kent co., Del., May 28, 1786, died in Baltimore, Oct. 7, 1857. He was the son of Allen McLane, a distinguished revolutionary officer. He entered the navy at an early age and served as a midshipman under the elder Decatur. He quitted the navy in 1801 at the desire of his family, studied law, was admitted to the bar in 1808, and rose to eminence in the profession. During the war with England he served as a volunteer in a company which marched to the defence of Baltimore in 1814. In 1816 he was elected representative in congress from the state of Delaware, and was successively reelected till 1827, when he was chosen U. S. senator. In May, 1829, he was appointed by President Jackson minister to Great Britain, which post he held for two years, and on his return home was made secretary of the treasury. In 1833 he declined to sanction the removal of the deposits from the U. S. bank, and was consequently transferred by the president to the state department. He held the office of secretary of state till June, 1834, when he resigned and retired from political life. In 1837 he accepted the presidency of the Baltimore and Ohio railroad, which he held till 1847. In June, 1845, he was appointed by President Polk ambassador to London during the pendency of the Oregon negotiations, after the settlement of which he resigned. In 1850 he was a member of the convention to reform the constitution of Maryland, which was his last public service.

MACLAREN, CHARLES, a Scottish journalist and author, born about 1785. In 1817, while holding a subaltern position in the excise, he projected the "Scotsman" newspaper, of which between 1820 and 1847 he remained the responsible editor. The journal was conducted with ability, and under his direction became the leading organ of the liberal party in Scotland. Mr. MacLaren, who is chiefly a self-educated man, possesses a considerable knowledge of geology and physical geography, is a careful statistician, and an elegant writer. He has published a "Treatise on the Topography of Troy," "The Geology of Fife and the Lothians," and is the author of a variety of scientific papers contributed to the periodicals.

MACLAURIN, COLIN, a Scottish mathematician, born in Kilmoran, Argyleshire, in Feb. 1698, died in Edinburgh, June 14, 1746. He was educated at the university of Glasgow, and in 1717 was appointed professor of mathematics in the Marischal college, Aberdeen, which posi-

tion he occupied until 1735, when, at the recommendation of Sir Isaac Newton, whose acquaintance he had formed during a visit to London in 1719, he was called to the mathematical chair of Edinburgh. During the rebellion of 1745 he sided with the existing government, and personally superintended the formation of trenches, batteries, and other defences hastily thrown up around Edinburgh. Upon the entrance of Charles Edward into the city he took refuge with Dr. Herring, archbishop of York, but returned to the city when quiet was restored. He died shortly afterward, having held the mathematical professorship over 20 years. His works are: *Geometria Organica* (London, 1730); "Treatise on the Percussion of Bodies" (1724), for which he received the prize of the academy of sciences; a "Treatise on Fluxions" (2 vols. 4to., Edinburgh, 1742), written partly in reply to an attack of Bishop Berkeley on the principles of fluxions, and the most complete treatise on the subject, as well as the author's most profound work; a "Treatise on Algebra" (1748); and an "Account of Sir Isaac Newton's Philosophical Discoveries" (London, 1748), left unfinished by the author, and published from his papers. He also contributed numerous mathematical papers to the "Philosophical Transactions," on curves, equations with impossible roots, &c.

MACLAY, ARCHIBALD, D.D., an American clergyman, born in Killearn, Scotland, May 14, 1778, died in New York, May 2, 1860. His father having died, he undertook at the age of 12 the support of his mother and sisters, employing his spare time in study with a view of entering the ministry as an Independent. Having removed with his family to Glasgow, he was assisted by Mr. Robert Haldane, who offered him the means of procuring an education and a comfortable support till he should enter the ministry. In 1802 he commenced preaching at Kirkcaldy in Fifeshire. In 1804 he was appointed a missionary to the East Indies by a society in Edinburgh; but as he was about to sail, the British government interposed objections, and he was compelled to relinquish the enterprise. He then, on the advice of Mr. Haldane, sailed for New York in Oct. 1805, commenced preaching in Rose street, and soon organized a church. In 1808 he united with the Baptists, and most of his congregation in Rose street followed him. A church was organized soon after, of which he remained pastor until 1837, when he resigned, to become the general agent of the American and foreign Bible society, then just organized. He retained this agency for 18 years, visiting every part of the Union many times, and extending his journeys occasionally into the British provinces and Great Britain. The Bible translation society in England was among the results of his labors. One of his addresses was translated into several languages, and more than 100,000 copies of it circulated. In 1850 he became an officer and general agent of the Bible union, a society organized mainly for

the revision of the English Scriptures, and in 1856 was elected its president; but becoming dissatisfied with its management, he withdrew from it, and published his reasons for so doing. He continued to preach till within a few months of his death. Though an able and vigorous writer, Dr. Maclay published very little. He was esteemed a superior preacher.

MACLEAN, a central co. of Ill., drained by tributaries of the Illinois river; area, 1,182 sq. m.; pop. in 1855, 19,578. Much of the surface is prairie; the soil is very fertile. The productions in 1850 were 63,693 bushels of wheat, 1,226,588 of Indian corn, 126,159 of oats, and 49,883 lbs. of wool. There were 15 flour mills, 2 saw mills, 11 churches, and 900 pupils attending schools. The St. Louis, Alton, and Chicago, and the Illinois central railroads intersect the county, passing through the capital, Bloomington.

MACLEAN, JOHN, LL.D., an American judge and statesman, born in Morris co., N. J., March 11, 1785. Four years afterward, his father, a poor man with a large family, removed to the West, settling first at Morganstown, Va., afterward near Nicholasville, Ky., and finally in 1799 in what is now Warren co., Ohio. Here he cleared a farm, upon which he resided till his death 40 years later. His son, at the age of 18, desiring to study law, went to Cincinnati, where he maintained himself by writing in the office of the clerk of the county, while he pursued his studies under the direction of Arthur St. Clair, an eminent counsellor, the son of the revolutionary general of that name. In the spring of 1807 he was married to Miss Rebecca Edwards, and in the autumn of the same year was admitted to the bar and commenced practice at Lebanon, Warren co., O. In Oct. 1812, he was elected to represent in congress his district, which then included Cincinnati, receiving a large majority, as a democrat in favor of the war with England and a supporter of President Madison's administration. In 1814 he was unanimously reelected, receiving the vote of every voter that went to the polls. In 1815 he declined to be a candidate for the U. S. senate, though his election was certain; and in 1816, the legislature of Ohio having unanimously elected him a judge of the supreme court of the state, he resigned his seat in congress at the close of the session. He remained upon the supreme bench of Ohio till 1822, when he was appointed by President Monroe commissioner of the general land office. In July, 1822, he was appointed postmaster-general, the post office department being then in a very disordered and inefficient condition. Under his administration this branch of the public service was restored to order, and managed with a vigor, method, and economy, that soon secured an almost unexampled degree of applause and public confidence. By a nearly unanimous vote of the senate and house the postmaster-general's salary was raised from \$4,000 to \$6,000 a year. John Randolph, who voted against the increase,

said he would vote for it if the salary could be reduced to its original amount whenever Judge McLean went out of office. In 1829, having declined the war and navy departments, which were offered to him by President Jackson, Judge McLean resigned the office of postmaster-general and accepted a seat upon the bench of the supreme court of the United States, entering upon his duties as associate justice at the January term of 1830. In this capacity his charges to grand juries while on circuit are distinguished for ability and eloquence. One of the most noted of these was delivered in Dec. 1838, in regard to aiding or favoring unlawful military combinations by our citizens against any foreign government or people with whom we are at peace, with special reference to the Canadian insurrection and its American abettors. In the *Dred Scott* case he dissented from the decision of the court as given by Chief Justice Taney, and expressed the opinion that slavery has its origin merely in power, and is against right, and in this country is sustained only by local law. Judge McLean has long been identified with the party opposed to the extension of slavery, and his name was before the free soil convention at Buffalo in 1848 as a candidate for nomination as president. At the republican national convention at Philadelphia in 1856, he received 196 votes for the same office to 359 for Col. Fremont. At the republican convention at Chicago in 1860 he also received a number of votes.

MACLEAN, LETITIA ELIZABETH. See **LANDON.**

MACLENNAN, a central co. of Texas, intersected by the Brazos river; area, 800 sq. m.; pop. in 1858, 4,378, of whom 1,835 were slaves. Its surface is undulating, the river and creek bottoms well timbered, oak, cedar, and elm being abundant, and the soil of the bottoms and the prairie exceedingly fertile, producing cotton, corn, wheat, and other grain. In 1858 there were 4,404 acres planted in cotton, 10,565 in corn, and 4,388 in wheat. Aggregate taxable property in 1859, \$2,548,565. Capital, Waco.

MALEOD, ALEXANDER, D.D., an American clergyman, born in the island of Mull, Scotland, June 12, 1774, died in New York, Feb. 17, 1838. Emigrating to the United States in 1792, he established himself in Princetown, N. Y., and, having soon after joined the Reformed Presbyterian church, entered Union college with the intention of qualifying himself for the ministry, and was graduated in 1798. In 1799 he was licensed as a preacher, and two years afterward was ordained and installed to the charge of a congregation in New York, and of one in Wallkill, Orange co., N. Y. The latter he soon after resigned; but his connection with the New York congregation, which under his ministry increased greatly in numbers and influence, terminated only with his death. He was esteemed one of the most powerful preachers of his denomination, and was widely known by his publications and sermons on religious subjects,

as well as those of public policy. He early distinguished himself by his opposition to negro slavery. His principal works are: "Negro Slavery Unjustifiable," a discourse (New York, 1802; new ed. 1860); "Ecclesiastical Catechism" (1807), of which upward of 12 editions were published; "Lectures upon the Principal Prophecies of the Revelation" (8vo., 1814); "View of the Late War" (8vo., 1815); "The Life and Power of True Godliness" (8vo., 1816); and the "American Christian Expositor" (2 vols. 8vo., 1832-'38). He also contributed largely to a variety of religious periodicals, and edited "The Large Catechism," the first book that was stereotyped in America. In 1855 appeared "Mémoir of Alexander McLeod, D.D.," by Samuel B. Wiley, D.D. (8vo., New York).—**XAVIER DONALD**, an American author, son of the preceding, born in New York, Nov. 17, 1831. He was graduated at Columbia college, and after studying theology he took orders in the Episcopal church in 1845. He was settled for a short time in a rural parish, and in 1850 went to Europe, where he travelled and studied until 1852. During his residence abroad he became a Roman Catholic. After his return he devoted himself to literary pursuits, contributing to various magazines, and publishing "Pynnhurst, his Wanderings and Ways of Thinking" (New York, 1853); "Life of Sir Walter Scott" (1852); "The Bloodstone" (1853); and the "Life of Mary, Queen of Scots" (1857). Mr. McLeod is also the author of "The Elder's House, or the Three Converts;" "Château Les-cure, or the Last Marquis;" and a "Life of Fernando Wood," the mayor of New York (1856). McLeod's fugitive poems are his most characteristic productions; some of them, as "The Weeder" (Putnam's Monthly) and "The Saga of Viking Torquil" (Knickerbocker Magazine) have great merit. In 1857 he removed to St. Louis, Mo., where he was for some time editorially connected with the "Leader" newspaper, then under the direction of Dr. J. V. Huntington. He subsequently became professor of rhetoric and belles-lettres at Mount St. Mary's (R. O.) college near Cincinnati, and is now (June, 1860) qualifying himself for orders in the Roman Catholic church.

MAOLISE, DANIEL, R.A., a British artist, born in Cork, Jan. 25, 1811. While a boy he was placed with a banker in Cork, but at the age of 16 he forsook this occupation to devote himself to the study of painting, for which he had shown a strong predilection. In 1828 he was admitted a pupil of the antique and life schools at the royal academy, at both of which he gained prizes, and in 1830 studied for some months in the galleries of Paris. In the succeeding year he took the gold medal of the royal academy for his oil painting, the "Choice of Hercules," which was followed in 1832 by his "Allhallow Eve in Ireland," and in 1833 by another Irish subject, "The Installation of Captain Rock." Thenceforth he became a busy contributor to the annual exhibitions of the

academy, of which in 1885 he was elected an associate and in 1840 a member. Among his most popular works are: "The Play Scene in Hamlet" and "Malvolio and the Countess," both in the Vernon gallery, "The Author's Reception by the Players" and other scenes from "Gil Blas," several from the "Vicar of Wakefield," "Christmas in the Baron's Hall," "Origin of the Harp," and "The Sacrifice of Noah," painted in oil; a fresco from "Comus" in the pavilion of Buckingham palace, and others illustrating passages in English history in the new palace at Westminster. At various periods of his life he has furnished sketches for illustrated annuals and magazines, including a series of caricatures for "Fraser's Magazine," and has made designs for art manufacture. With a marked tendency to illustrate Irish history and character, he has for the most part devoted himself to chivalric and romantic subjects.

MACLURE, WILLIAM, an American geologist, born in Ayr, Scotland, in 1768, died in San Angel, near the city of Mexico, March 23, 1840. At 19 years of age he visited New York, and immediately returned to London to become a partner in the commercial house of Miller, Hart, and co., in which he rapidly acquired a fortune. In 1796 he again visited the United States, and in 1803 was in Europe as one of the commissioners to settle the claims of American citizens against France for spoiliations during the revolution in that country. While on the continent he travelled extensively, examining the geology of Europe, and collecting objects in natural history for the United States, to which he had always looked forward as his future home. On returning, he engaged with zeal in the extraordinary private undertaking of a geological survey of the whole country. Depending on his own resources and observations at a time when geology was unknown as a science, and few could appreciate his motives, he visited almost every state and territory, crossing and recrossing the Alleghanies no fewer than 50 times. In 1807 he visited New Haven, and there found Prof. Silliman, then lately from Edinburgh, whence he had brought the geological knowledge of the day acquired in the exciting discussions of the Wernerian and Huttonian controversy. His first communication to the public was a memoir entitled "Observations on the Geology of the United States, explanatory of a Geological Map," read before the American philosophical society, Jan. 20, 1809, and published in vol. vi. of their "Transactions." He still continued his explorations, and on May 16, 1817, presented another memoir to the society, which was published in their "Transactions," and also in a separate volume with a colored map and sections. The former publication was 6 years prior to that of the geological map of England prepared by William Smith, a production which gave him the title of father of English geology. To Maclure is equally due the title of father of American geology. His publications attracted much attention to the science,

and his enthusiasm was communicated to new observers. A map covering a field so vast and new, and as afterward found so complicated in its structure, could not be otherwise than rude and imperfect. It presented the general range of the secondary, transition, and primitive rocks, as they were then called, with considerable accuracy; but the tertiary groups, the arranging of which really involved an acquaintance with their fossils, were very imperfectly defined. Philadelphia was selected by Maclure for his residence when not engaged in his explorations. He joined the academy of natural sciences of Philadelphia, which was founded in Jan. 1812, and its library and museum were made the recipients of his books and specimens. On Dec. 30, 1817, he was elected president of the academy, and was reelected every year thereafter to the time of his death. The "Journal" of the academy was commenced under his auspices, and the first volume was printed in an apartment of his own house. His donations of books to the society included nearly 1,500 volumes, among which were 600 quartos and 146 folios on natural history, the fine arts, &c.—a collection such as was then possessed by no other institution in the United States. In 1816-'17 he visited the West India islands to examine the geology of the Antilles, an account of which, submitted to the society, Oct. 23, 1817, was published in vol. i. of their "Journal." In 1819 he visited France, and then went to Spain to establish a great agricultural school for the lower classes, in which labor should be combined with moral and intellectual culture. He purchased from the revolutionary government 10,000 acres of land near Alicante; but when his buildings were completed, the government was overthrown, and his property reverted to the church from which it had been confiscated. After a hazardous geological tour through the southern parts of Spain, he returned in 1824 to the United States. Here he attempted to carry out a similar plan of an agricultural school, and removed to the New Harmony settlement in Indiana, not, however, adopting the peculiar views of this community. Several distinguished naturalists from Philadelphia joined him in this enterprise, as Mr. Thomas Say, Dr. Troost, Mr. Lesueur, and a few others of scientific reputation. The scheme failed, but Mr. Maclure, having purchased largely of land in and around New Harmony, remained there several years in the hope of bringing his school into operation. The failure of his health at last caused him to seek a more genial climate; and in 1827 he embarked for Mexico with his friend Mr. Say. The next summer they returned; but Mr. Maclure, after attending the meeting of the American geological society in New Haven, Nov. 17, 1828, as the presiding officer, again embarked for Mexico, where he continued to reside, always however with the intention of returning to the United States, and with his interest in the progress of scientific education there unabated. The death of Mr. Say at New Harmony in 1834 caused

him to lose all interest there, and he gave directions for the removal of his library to the academy of natural sciences. This second donation comprised 2,259 volumes, with numerous maps and charts. The American geological society at New Haven also received from him many very valuable works and specimens. To insure a suitable building to the academy of natural sciences for the preservation of their books and collections, he contributed at different times up to 1888 the sum of \$20,000, by means of which they were enabled to complete the edifice on Broad street in Feb. 1840. At this time MacLure was seeking to return to the United States. Enfeebled in health, arrangements were made for his being borne to the coast on a litter; but his strength failing, he was obliged to return, halting first at the house of Farias, ex-president of Mexico, and next at the village of San Angel, where he died. In the early volumes of the "American Journal of Science" are many communications from Mr. MacLure. While in Mexico he wrote "Opinions on Various Subjects," devoted mainly to political economy (2 vols. 8vo., New Harmony, 1837).

MACMAHON, MARIE EDMÉ PATRICE MAURICE, duke of Magenta, a French soldier, descended from an ancient and noble Irish family, born in Autun about 1807. His father was a peer of France and a personal friend of King Charles X. After having completed his education at the military school of St. Cyr, he took part in the expedition to Algiers. He afterward acted as Gen. Achard's aide-de-camp at the siege of Antwerp, and then returning to Africa, evinced much skill and courage, especially at the capture of Constantine. The province of that name and that of Oran were placed under his command in 1848. He was promoted to the rank of captain in 1833, colonel in 1845, brigadier-general in 1848, and general of division in 1852; and in 1855 he succeeded Canrobert in the Crimea, where as commander of a division of infantry he took a memorable part in the bombardment of Sebastopol, and particularly in the storming of the Malakoff, succeeding on Sept. 8 in forcing an entrance into that fort and maintaining his position there. He was rewarded by the grand cross of the legion of honor and the dignity of senator. At the outbreak of the Italian war in the spring of 1859 he was appointed commander of the 2d corps of the army of the Alps, and the victory at Magenta (June 4) was chiefly due to his exertions. Napoleon III. conferred on him on the battle field the rank of marshal of France and the title of duke of Magenta.

MACMINN, a S. E. co. of Tenn., bordered on the S. W. by the Hiwassee river and drained by its tributaries; area, 475 sq. m.; pop. in 1850, 13,906, of whom 1,568 were slaves. It has an undulating surface and fertile soil. The productions in 1850 were 989,116 bushels of Indian corn, 216,154 of oats, 56,559 of sweet potatoes, and 10,720 lbs. of tobacco. There were 25 flour mills, 20 saw mills, 7 tanneries, 37

churches, and 8,996 pupils attending schools. The E. Tennessee and Georgia railroad intersects the county, passing through the capital, Athens.

MACNAB, SIR ALAN NAPIER, a Canadian statesman, born at Niagara, Feb. 19, 1798. He is of Scottish extraction; his grandfather was a royal forester of Scotland, and his father was lieutenant of a dragoon regiment and principal aide-de-camp to Gen. Simcoe during the revolutionary war. When, during the war of 1812-'15, the Americans attacked Toronto (April 27, 1813), Alan, then a school boy, carried a musket and retreated with the British to Kingston. Shortly afterward he entered the navy as midshipman on board Sir James Yeo's ship, and accompanied the expedition to Sackett's Harbor and other American lake ports; but he soon abandoned the navy for the army, was present at the capture of Fort Niagara, and commanded the advanced guard at the battle of Plattsburg. At the close of the war he studied law, and practised in Hamilton, acting at the same time as clerk of the journals in the legislative assembly of Upper Canada. In 1829 he was elected a member of the assembly for the county of Wentworth, and after serving 3 terms was returned by the electors of Hamilton. He was subsequently chosen speaker of the lower house. During the insurrection of 1837-'8 he commanded the militia on the Niagara frontier, having the rank of colonel. He routed the insurgents near Toronto, Dec. 7, 1837, and soon afterward, a party of American sympathizers having occupied Navy island in the Niagara river, whence they were cannonading the village of Chippewa on the Canadian side, he sent a party to seize the steamer Caroline, which was employed to convey them supplies, and having driven the crew ashore set fire to it and sent it over the falls. Although the seizure was made on the American side of the river, and provoked in consequence much angry comment in the United States, the act was approved by the British government, and in the opinion of Sir Francis Head prevented an open rupture between this country and England. For his services to the crown during this insurrection Mr. Macnab was knighted, July 14, 1838. After the union of the two provinces of Canada he became speaker of the new legislature, and in 1854 was prime minister under the earl of Elgin, retaining office for a few months under his successor Sir Edmund Head. On retiring from the premiership in 1856 he was made a baronet of the United Kingdom. He has withdrawn from public life.

MACNAIRY, a S. W. co. of Tenn., drained by Forked Deer river and branches of the Big Hatchie; area, 620 sq. m.; pop in 1850, 12,864, of whom 1,893 were slaves. Its productions in 1850 were 571,080 bushels of Indian corn, 55,382 of oats, 45,472 of sweet potatoes, and 9,180 lbs. of tobacco. There were 39 grist mills, 12 saw mills, 5 tanneries, 44 churches, and 2,500 pupils attending schools. The Mobile and Ohio railroad passes through the county. Capital, Purdy.

MACNALLY, LEONARD, an Irish lawyer and dramatist, born in Dublin in 1752, died in 1820. He went to London in 1778, and while studying at the Middle Temple earned a support by writing for the stage and editing the "Public Ledger" and several magazines. After being called to the bar he attempted practice in Ireland, but poverty soon drove him back to London, where he employed the intervals of his light professional engagements by contributing to periodicals, and composing farces, comedies, and operas, which enjoyed great popularity. Though professedly a friend of the Irish patriots, it has lately been discovered that he was a government spy, to whom was owing the capture of Lord Edward Fitzgerald. He ultimately returned to Ireland, where he became one of the most distinguished members of the bar in the department of "crown law," and wrote "Rules of Evidence on Pleas from the Crown" (1803), and "The Justice of Peace of Ireland" (1808).

MACNEIL, JOHN, an American general, born in New Hampshire in 1784, died in Washington, D. C., Feb. 23, 1850. In March, 1812, he was commissioned a captain in the 11th regiment of infantry, and subsequently participated with great credit in the battle of Chippewa, the bayonet charge of the 11th regiment under his command being chiefly instrumental in securing the victory to the Americans. For his conduct in this battle, and in that of Bridgewater, where he was severely wounded, he was appointed successively brevet lieutenant-colonel and brevet colonel. He was retained in the service after the peace, and attained the rank of brevet brigadier-general and colonel of the 1st regiment of infantry. He resigned his commission in 1830. Subsequently he was for many years surveyor of the port of Boston, to which office he was appointed by President Jackson.

MACNEILL, HECTOR, a Scottish poet, born in Rosebank, on the Esk, Oct. 22, 1746, died in Edinburgh, March 15, 1818. The pecuniary circumstances of his family obliged their removal from the neighborhood of Hawthornden to a farm on the banks of Loch Lomond. There he received his early education, for a short time at a neighboring school, but chiefly under the care of his father at home. At the age of 12 he was sent for two years to Glasgow to prepare himself for a mercantile life, completed his commercial education in the counting house of a wealthy relative in Bristol, and went thence to the West Indies, whence he returned after 6 years with no gains. The small inheritance to which he succeeded on the death of his father was also lost. He therefore obtained an appointment as assistant secretary in the flag ship of Admiral Geary, which after two cruises he exchanged for a similar appointment in another ship bound to the East India station, where he remained 5 years. He afterward passed two years in retirement near Stirling, where he wrote his descriptive poem, "The Links of Forth, or a Parting Peep at the Carse of Stirling." He again visited the West Indies, was

engaged in the custom house at Kingston, Jamaica, was enfeebled by fever, and soon after returned. He published in 1788 a statement concerning the treatment of negroes, and in 1789 his poem of "The Harp," founded on a legend of the Hebrides. During a residence near the field of Bannockburn he wrote in verse the temperance tale of "Scotland's Skaith, or the History o' Will and Jean." His health was restored and a competence secured by a third residence in Jamaica, and he spent his last years in Edinburgh in affluence, publishing poems which were universally popular in Scotland. His principal later writings are: "The Pastoral or Lyric Muse of Scotland" (1808); "Town Fashions" (1810); "Bygone Times and Late Come Changes" (1811); and "The Scottish Adventurers" (1812).

MACNEVEN, WILLIAM JAMES, an Irish patriot, and subsequently professor of chemical science in the medical schools of New York, born in Ballynahowne, Galway, March 26, 1768, died July 12, 1841. He was educated in Germany, was graduated M.D. at Vienna in 1788, returned to his native country, and commenced the practice of physic in Dublin. He was diverted from his original intention by his political associations. His intimacy with Lord Edward Fitzgerald, Tone, Emmet, and Sampson, his arrest on March 12, 1798, his confinement in Kilmainham and subsequent removal to Fort George, are detailed by Dr. Madden in his second series of the "Lives of the United Irishmen." After the liberation of the prisoners of Fort George, he passed the summer and autumn of 1802 in travelling through Switzerland on foot, and wrote an account of his journey, entitled "A Ramble through Switzerland." In Oct. 1802, he entered Paris, and a few months after joined the French army as a captain in the Irish brigade. According to a letter of his friend Emmet, he had been in communication with Talleyrand, and had sought an interview with Bonaparte. He entertained the idea of an attack upon Ireland by the French, and in enrolling himself in the service of France he conceived he was only in another way devoting himself to that cause which he had espoused elsewhere. He was disappointed in his hopes, resigned his commission, and in June, 1806, set sail for New York, where he arrived on the 4th of July following. He there entered upon the practice of medicine, received from Columbia college the honorary degree of M.D., and, soon after the organization of the college of physicians and surgeons in 1807, was appointed professor of midwifery; upon its reorganization in 1811 he was made professor of chemistry, and in 1816 the department of *materia medica* was added to his chair. In 1826 he resigned his official connection with the regents, and with his colleagues Mott, Hosack, and Francis, aided by Godman and Griscom, organized the Rutgers college, with which he remained connected until its dissolution. He was married in 1810 to Mrs. Tom, widow of an eminent merchant. Beside his

"Rambles in Switzerland," he published "Pieces of Irish History," an "Exposition of the Atomic Theory," which was received with favor both abroad and at home, and an edition of Brande's "Chemistry;" and he was co-editor for 8 years with Dr. De Witt of the New York "Medical and Philosophical Journal." In 1812 he was appointed resident physician by Gov. Clinton, and in 1840 by Gov. Seward.

MACNISH, ROBERT, LL.D., a British physician and author, born in Glasgow, Feb. 15, 1801, died there in Jan. 1837. He studied his profession in Glasgow and Paris. While young he wrote for several Scottish magazines, and in 1825 became known as "The Modern Pythagorean" to the readers of "Blackwood," contributing under that name a series of tales and sketches which were extremely popular. His "Anatomy of Drunkenness" (1831) was one of the first works in which that vice was discussed from a purely physiological point of view. His "Philosophy of Sleep" not only attained popularity in Great Britain and America, but was, with the "Anatomy of Drunkenness," translated into French and German. In 1833 he published his "Book of Aphorisms," and in 1835 his "Introduction to Phrenology."

MACOMB, an E. co. of Mich., bordering on Lake St. Clair, and drained by Clinton river and its branches; area, 460 sq. m.; pop. in 1850, 15,530. In the E. the surface is level and well timbered, and in the W. hilly and broken; the soil is deep and fertile. The productions in 1850 were 129,808 bushels of wheat, 107,596 of Indian corn, 158,145 of oats, and 101,084 lbs. of wool. There were 8 grist mills, 8 saw mills, 5 iron foundries, 15 churches, and 4,427 pupils attending schools. Capital, Mount Clemens.

MACOMB, ALEXANDER, an American general, born in Detroit, Mich., April 3, 1782, died in Washington, D. C., June 25, 1841. He entered the U. S. army in 1799 as a cornet of cavalry, was retained in the service after the partial disbanding of the army in 1802, and at the commencement of the war with Great Britain in 1812 held the rank of lieutenant-colonel of engineers and adjutant-general of the army. Finding his position not likely to bring him into active service, he was transferred to the artillery, and in 1813, as colonel of the 8d regiment of artillery, distinguished himself at Niagara and Fort George. In Jan. 1814, he was promoted to be a brigadier-general and placed in command of that part of the northern frontier bordering on Lake Champlain. At Plattsburg on Sept. 11, 1814, being in command of about 1,500 regular troops and some detachments of militia, he sustained the attack of a greatly superior British force under Sir George Prevost, which, after the defeat of the British squadron on Lake Champlain on the same day, retreated to Canada. For his firmness and courage on this occasion, he was commissioned a major-general, and received the thanks of congress and a gold medal. He was subsequently retained in the service as colonel of engineers, and after the de-

cease of Maj. Gen. Brown in 1835 succeeded to the office of commander-in-chief of the army, which he held until his death. He wrote a "Treatise on Martial Law and Courts Martial, as practised in the United States" (8vo., 1809).

MACON, the name of counties in 6 of the United States. I. A W. co. of N. C., extending across the state and bordering on Ga. and Tenn., and intersected by the Tennessee river; area, 810 sq. m.; pop. in 1850, 6,889, of whom 549 were slaves. On the N. W. is Iron or Great Smoke mountain, and on the S. E. border the Blue Ridge. It has an elevated surface and productive soil. The productions in 1850 were 3,687 bushels of wheat, 225,379 of Indian corn, and 24,710 lbs. of tobacco. There were 20 grist mills, 2 saw mills, 8 tanneries, 9 churches, and 1,850 pupils attending schools. Capital, Franklin. II. A S. W. co. of Ga., drained by Flint river and its tributaries; area, 358 sq. m.; pop. in 1850, 8,288, of whom 4,570 were slaves. It has an undulating surface and fertile soil. The productions in 1850 were 258,364 bushels of Indian corn, 93,557 of sweet potatoes, 24,890 lbs. of rice, and 5,773 bales of cotton. There were 14 grist mills, 9 saw mills, 23 churches, and 850 pupils attending schools. Value of land in 1856, \$1,271,527. The south-western and Muscogee railroad passes through the county. Capital, Lanier. III. An E. co. of Ala., bordering on Ga., drained by branches of the Tallapoosa river; area, 970 sq. m.; pop. in 1850, 26,898, of whom 15,596 were slaves. It has an undulating surface and productive soil. The productions in 1850 were 993,867 bushels of Indian corn, 288,880 of sweet potatoes, 191,140 lbs. of rice, and 2,089 bales of cotton. There were 9 grist mills, 8 saw mills, 28 churches, and 1,842 pupils attending schools. The Montgomery and West Point railroad intersects the county. Capital, Tuskegee. IV. A N. co. of Tenn., bordering on Ky., drained by branches of the Big Barren and Cumberland rivers; area, 260 sq. m.; pop. in 1850, 6,948, of whom 766 were slaves. The surface is uneven, and the soil generally fertile. The productions in 1850 were 302,505 bushels of Indian corn, 44,365 of oats, 15,416 of sweet potatoes, and 941,268 lbs. of tobacco. There were 17 churches, and 700 pupils attending schools. Capital, Lafayette. V. A central co. of Ill., intersected by the north fork of the Sangamon river; area, 549 sq. m.; pop. in 1856, 8,365. It has a generally level surface and productive soil. The productions in 1850 were 22,226 bushels of wheat, 693,220 of Indian corn, 90,805 of oats, and 18,883 lbs. of wool. There were 5 churches, and 600 pupils attending schools. The Illinois central railroad and the great western railroad intersect the county, passing through the capital, Decatur. VI. A N. co. of Mo., drained by Chariton river and its E. fork and branches of Salt river; area, 628 sq. m.; pop. in 1856, 8,285, of whom 421 were slaves. Its surface is undulating and soil productive. The productions in 1850 were 19,181 bushels of wheat, 420,023 of Indian corn,

76,688 of oats, and 20,976 lbs. of wool. There were 6 grist mills, 6 saw mills, 7 churches, and 588 school pupils. Capital, Bloomington.

MACON, a city and the capital of Bibb co., Ga., situated at the head of steamboat navigation on both sides of the Ocmulgee river, which is here crossed by a bridge, 80 m. S. W. from Milledgeville and 190 m. W. N. W. from Savannah; pop. in 1850, 5,720; in 1860, about 8,000. It contains a great number of elegant public and private buildings, among which are the courthouse, market house, and 8 or 9 churches. There are 3 banks, 4 branch banks, an academy, and 5 or 6 newspaper offices. Macon is also the seat of the Georgia academy for the blind, founded by the citizens of Bibb co., and incorporated in 1852, and of the Wesleyan female college, founded in 1839, and having in 1859 10 professors, 178 students, 347 alumni, and a library of 1,600 volumes. Rose Hill cemetery, near Macon, is one of the most beautiful burial grounds in the United States. It is situated on the Ocmulgee, about $\frac{1}{4}$ m. below the city, mostly on elevated ground, the highest point being 142 feet above the bed of the river, and comprises about 50 acres. Macon is on the line of the central Georgia railroad, and is a terminus of the Macon and western and the south-western railroads. It was settled in 1823.

MÂCON, a town of France, capital of an arrondissement of its own name, in the department of Saône-et-Loire (Burgundy), on the left bank of the Saône, 275 m. by railway S. S. E. from Paris, and 48 m. N. from Lyons; pop. in 1856, 15,000. The annual value of the goods manufactured in the arrondissement is about \$3,000,000. They consist chiefly of clocks, watches, machinery, casks, earthenware, copperware, covers of wool, velvet, &c. Mâcon is the centre of a great trade in Burgundy wine. The best sorts are the growths of Thorins and Moulin à Vent, which are red, and of Pouilly, a white wine. The commerce in grain, flour, hoops, horns, and cattle is also considerable. Lamartine is a native of Mâcon.

MACON, NATHANIEL, an American statesman, born in Warren co., N. C., in 1757, died at his plantation in the same county, June 29, 1837. His ancestors were from Virginia, people of a high respectability and more than ordinary wealth. He was educated at Princeton, N. J., and was there at the opening of the war of the revolution. In 1777 he left college, and served for a short time as a private in a company of volunteers. Returning at the expiration of this service to North Carolina, he entered upon the study of the law, but soon enlisted again as a volunteer, and, though divers offices were urged on him, served as a common soldier under the command of his brother, Col. John Macon. He continued in the army till the provisional treaty of peace in 1782, and was present at the fall of Charleston, the rout at Camden, and during the pursuit of Greene across Carolina by Lord Cornwallis. For his military service he steadily refused any pay; nor, after that provision had

been made by the government, would he accept a pension. While yet in the army, in 1780, he was elected, in his 24th year, a member of the senate of North Carolina, in which post he continued to serve through 1785. Young as he was, he was employed on the most important committees of that body. The great questions then agitated arose from the financial difficulties of the state, and the depreciated value of the currency. It was characteristic of the man that he advocated the scheme of pledging the credit of the state to redeem her paper issues at their then depreciated rates, maintaining the injustice of allowing a set of speculators to gain what the soldiers to whom the paper had been paid must lose. But he held that the promises of the state must, at any rate, be redeemed. During this period he was married to Miss Hannah Plummer, and soon afterward settled on a plantation which he owned on the bank of the Roanoke, in Warren co., and made this spot his home for the remainder of his life. Here his main occupation and enjoyment were in the cultivation of his farm, in which he displayed singular skill and met with great success. Both in private and public he showed much of the stoic in temper, disregarding style and pleasure, studying strict economy, and holding fast his opinions, and carrying them into practice, to whatever odium or unkind remark they might expose him. When the constitution of the United States was first submitted to the vote of the people of North Carolina, he firmly opposed it as conferring too much power on the new government, as making it in effect independent of the states, and so of the people, and tending to corruption. He retained this dislike to the end of his life, and in the times of "nullification" he boasted of the accuracy of his forebodings. He was elected a member of the U. S. house of representatives in 1791, and continued in that office by successive elections till 1815, and was the speaker of the house from 1801 till 1806, when he would not be a candidate for reelection. From the lower house he was transferred in 1816 to the senate, where he served till 1828, being elected the president *pro tem.* in 1825-'7. Twice during Mr. Jefferson's administration he declined the postmaster-generalship. At the general election in 1824 the state of Virginia cast for him her 24 electoral votes for the vice-presidency of the United States. In 1828 he resigned his seat in the senate, and all the other public offices which he held, as trustee of the university of North Carolina, justice of the peace, &c. At that time he had been a member of congress for 37 successive years, a longer term of continuous service than has fallen to the lot of any other legislator in our country. It was then his purpose to withdraw finally from every form of public function. Yet in 1835 he presided over the convention that was called to revise the constitution of North Carolina, and rendered his last political service to the country as a member of the electoral college of that state in 1836.—Mr. Macon was always a

firm and consistent democrat. He had an unlimited confidence in the capacity of the people for self-government. A favorite saying of his was, that "if let alone they would always do what was right." He was therefore what in later times has been called a strict constructionist. He was disposed to hold the federal government and all state authorities within the narrowest limits of the powers granted to them; and used to insist on a complete responsibility to the people by a frequent return of all trusts to them. He voted for the embargo, and for the declaration of war against Great Britain, but withstood many of the schemes of the administration for carrying it on. He held that the war should be defensive only, and so refused to enlarge the naval force beyond what was needed to guard the coasts, voted against a system of fortifications, against privateering, &c. He also voted against all schemes of internal improvement to be undertaken by congress, spoke in 1795 against a grant to the count De Grasse, and in 1824 against a grant of lands to Gen. Lafayette for revolutionary services. In the convention of North Carolina he spoke against giving to free negroes the right to vote; against a land qualification of voters; against the state engaging in any works of internal improvement; against all religious tests as a condition of holding office; in favor of annual instead of biennial sessions of the general assembly; and in favor of voting *viva voce* at all elections. As a speaker, while he was in no sense an orator, few were really more effective. His longest speeches occupied hardly more than half an hour. Few men in congress were listened to with more respectful attention. Two sentences were enough to express his thanks for an election to the chair of the house of representatives, and seven words to announce to his constituents that war had been declared against Great Britain. It is hardly to be wondered at that a character so self-reliant, and with so many salient points, should have retained the public confidence so long; that Mr. Jefferson called him "the last of the Romans;" and that Mr. Randolph pronounced him "the wisest man he ever knew." He died after only a few hours' illness, but had already given directions to a neighbor to make for him a plain coffin, to be paid for before his interment, had selected for the place of his burial a barren ridge, where the plough could never come, and ordered the spot to be marked only by a pile of loose stones from the field. Mr. Macon was a student of few books beside the Bible, and was a member of the Baptist church. A sketch of his life, by Edward R. Cotton, was published at Baltimore in 1840.

MACONNAIS, an ancient territory in Burgundy, now comprised in the department of Saône-et-Loire. It was inhabited by the *Ædui*, conquered by Julius Cæsar, and in the 5th century by the Burgundians. Afterward it was united to the empire of Charlemagne, and at the end of the 9th century to the kingdom of

Arles. It became a hereditary county in the 10th century, and was purchased by Louis IX. in the early part of the 13th. The duke of Berry came into possession of it in the middle of the 14th century. It was restored to the crown in 1416; 19 years afterward Charles VII. gave it to Philip the Good, duke of Burgundy; and it was finally reunited to the French crown in 1477. Its capital, Mâcon, has been the seat of a bishopric since the 5th century.

MACOUPIN, a S. W. co. of Ill., drained by Macoupin, Otter, and Cahokia creeks; area, 864 sq. m.; pop. in 1855, 17,827. It has a diversified surface and excellent soil. The productions in 1850 were 77,022 bushels of wheat, 1,598,829 of Indian corn, 257,101 of oats, and 32,851 lbs. of wool. There were 20 grist mills; 10 saw mills, 2 tanneries, 20 churches, and 2,008 pupils attending schools. The Terre Haute, Alton, and St. Louis, and the St. Louis, Alton, and Chicago railroads intersect the county, the latter passing through the capital, Carlinville.

MACPHERSON, JAMES, a Scottish author, born in Ruthven, Inverness-shire, in 1788, died at his seat of Belleville, Feb. 17, 1796. He completed his education at the university of Aberdeen, and probably afterward studied for the ministry, although it is not certainly known that he ever took orders. At the university he gave evidences of a considerable taste for poetry, and in his 20th year ventured upon the publication of a poem in 6 cantos entitled the "Highlander," which excited no attention. Subsequently, while a private tutor in the family of Mr. Graham of Balgowan, he was encouraged by Home, the author of "Douglas," and Dr. Hugh Blair, to whom he had shown the work, to publish a small volume entitled "Fragments of Ancient Poetry collected in the Highlands of Scotland," and purporting to be a translation of genuine remains of ancient Celtic poetry. The enthusiasm and delight with which these "Fragments" were received were universal; men of letters, like Dr. Blair, Hume, and Dr. Robertson, expressed the highest opinion of their value; and a subscription was immediately raised to enable the author to undertake a mission to the highlands and secure such remaining specimens of Celtic poetry as it was intimated, might yet be recovered. Macpherson accordingly made an extensive tour through the mainland and islands inhabited by the Gaelic race, and published in 1762, as the first result of his explorations, "Fingal, an ancient Epic Poem in 6 Books; together with several other Poems composed by Ossian, the son of Fingal, translated from the Gaelic" (4to.), which was succeeded in the following year by "Temora, in 8 Books, with other Poems by Ossian." The reception of the first of these works was flattering in the extreme, and not only was it read with avidity in Great Britain, but speedily translated into the principal European languages, the author being alluded to in each instance in terms that, as he has himself expressed it, "might flatter

the vanity of one fond of fame." With the publication of "Temora," however, a change began to take place in public opinion, and gradually a party, small at first, but soon formidable in numbers and influence, sprung up, which did not hesitate to question the authenticity of the alleged translations. Macpherson, elated by prosperity and fame, affected to treat such doubts with contempt, and assumed a bearing so arrogant that Hume, who in 1760 had spoken of him as "a modest, sensible young man," declared 8 years later that he "had scarce ever known a man more perverse and unamiable." In 1764 he received the appointment of secretary to Gov. Johnstone of Pensacola; but after spending a short time in that colony and visiting other parts of North America, he returned in 1766 to England, and fixed his residence in London. In 1771 he produced a work entitled "An Introduction to the History of Great Britain" (4to.), composed, as he said, merely for private amusement, but which was attacked from many quarters with a severity little calculated to improve the author's irritable temper. Shortly afterward he still further endangered his literary reputation by a prose translation of the *Iliad* (1773), which was almost universally condemned as beneath criticism. So greatly was his prestige shaken by this publication, that Dr. Johnson, in reply to an abusive letter from Macpherson on the subject of the authenticity of the Ossianic poems, humiliated his adversary by telling him: "Your abilities since your Homer are not so formidable." In 1775 he produced his "History of Great Britain from the Restoration to the Accession of the House of Hanover" (2 vols. 4to.), written in the tory interest to detract from the integrity and patriotism of the men who had brought about the revolution of 1688, for the copyright of which he received £8,000; and about the same time he employed his pen in the service of the government, producing the "Rights of Great Britain asserted against the Claims of the Colonies" (1776), and "A Short History of the Opposition during the Last Session of Parliament" (1779), both of which went through several editions, the latter work being generally attributed to Gibbon. In reward for his services he was appointed agent to the nabob of Arcot, and was returned a member of parliament for Camelford, which he represented for upward of 10 years. His legislative career was not remarkable, and he never attempted to address the house. Compelled by failing health to withdraw from public life, he built a handsome seat at Belleville in his native Inverness-shire, whither he retired a few years before his death. His remaining works relate principally to Indian affairs. At his own request he was buried in Westminster abbey, the expense of erecting his monument being defrayed by himself.—The controversy respecting the authenticity of the alleged translations from the poems of Ossian, though of comparatively little interest to the present generation, was one of the most important in Eng-

lish literary history, as well on account of the eminence of those who participated in it, as of the activity and bitterness with which it was waged. Various shades of opinion, from utter disbelief in the Ossianic poems to enthusiastic adoption of every word they contained, characterized the arguments of the controversialists, the two extremes being represented by Dr. Johnson, Malcolm Laing, and a few others on the one side, and by Drs. Blair and Gregory, Lord Kames, Sir John Sinclair, and Mr. Alexander Macdonald on the other. Others again, like Dr. Graham of Aberfoyle, believed that the poems were to a certain extent authentic, the remainder being interpolations; while a fourth party, including David Hume and Dr. Smith of Campbelltown, entertained strong doubts of their authenticity, but hesitated to declare them entirely spurious. During the progress of the controversy, which commenced in 1763 and substantially terminated early in the present century, Macpherson maintained an obstinate silence, making no effort to rebut the charge of literary forgery brought against him, refusing to afford proofs of the authenticity of his translations, and affecting only indignation that his veracity should be called in question. When urged by the highland society of London (which, after a careful inquiry into the whole subject, had reported that no single poem, "the same in title and tenor with the poems published," could be discovered in all Scotland) to publish the originals of his Ossianic poems, he promised to employ his leisure time in arranging and printing them. At the time of his death, nevertheless, which occurred 33 years subsequent to the appearance of "Temora," they were not ready for the press, and only in 1806 were given to the world by Sir John Sinclair. But as the manuscripts were all in the handwriting of Macpherson or of his amanuenses, the proof of their authenticity was justly believed to have been in no degree advanced; and it has been suggested, and pretty generally believed, that whatever may have been the source from which the English versions of Ossian were derived, the so called "originals" were translated from them into Gaelic by Macpherson himself or by other persons in his employ; hence the delay in their publication. It was the opinion of Sir James Mackintosh that Macpherson originally had no serious intention of maintaining the authenticity of the Ossianic poems, but intended at some time to claim them as his own. "If he had such a design," says Sir James, "considerable obstacles to its execution arose around him. He was loaded with so much praise that he seemed bound in honor to his admirers not to desert them. The support of his own country appeared to render adherence to those poems, which Scotland inconsiderately sanctioned, a sort of national obligation. Exasperated, on the other hand, by the perhaps unduly vehement and sometimes very coarse attacks made upon him, he was unwilling to surrender to such opponents. He involved him-

self at last so deeply as to leave him no decent retreat." The poems themselves, which, notwithstanding their false imagery, the perpetual recurrence of the same ideas, the verbiage and bombast with which they abound, contain passages conceived with true feeling and power, have fallen into almost total neglect; and the present generation of readers, judging of them by their intrinsic value, are led to wonder that they should have formed the subject of any serious controversy.

MACRAUCHENIA (Owen), a genus of fossil herbivorous animals, forming one of the connecting links between the palæotherium and other extinct pachyderms of the Paris basin and the camel family, especially its American representatives. This genus was established in 1888 by Prof. Owen on some vertebrae and bones of extremities obtained by Mr. Charles Darwin in Patagonia, from an irregular bed of pale reddish earth and sand, evidently of subaqueous origin, overlying the porphyritic gravel at St. Julian, in lat. 49° 14' S.; the gravel bed itself was over the pumiceous strata and argillaceous beds of the upper tertiary formation. The bones were found in a deep furrow in the upper tertiary filled with the earthy deposit, evidently but recently elevated above the sea; indicating that this animal lived after the gravel was spread over this plain, and long after the existence of recent shells, which, according to Darwin, are among the most common now living on the coast. The *M. Patagonica* (Owen) was as large as the present hippopotamus and rhinoceros. The cervical vertebrae were very much like those of the llama, forming a long and slender neck, bearing probably a comparatively small head without a proboscis; as in the llama, these have no canal for the vertebral artery in their transverse processes, this vessel passing for a considerable part of its course in the spinal canal itself; their form is also elongated, with a slight anterior convexity and posterior concavity on their articulating surfaces, indicating a less freedom of motion in the neck. The lumbar vertebrae, though 7 in number as in the llama, in their form and the structure of their articulating surfaces resemble those of pachyderms, and indicate a slight concavity in the region of the loins. The union of the radius to the ulna, and of the fibula to the tibia, approximates it to the ruminants; but the feet resemble those of pachyderms (like the tapir) in having separated metacarpals, and 8 almost equal fingers terminating each in a small rounded hoof. According to Pictet, the molar teeth resemble those of the palæotherium, the last lower one having no 8d lobe, and the premolars being more simple. For details see Owen's description of the fossil mammals in the "Zoology of the Voyage of the Beagle" (1840).

MACREADY, WILLIAM CHARLES, an English actor, born in London, March 8, 1798. His father, the lessee and manager of several provincial theatres, having designed him for one of the learned professions, he was placed at 10

years of age at Rugby school, where he attained considerable reputation as a classical scholar. About 1810 the elder Macready became so seriously embarrassed in his pecuniary affairs, that his son, who was preparing to proceed to Oxford, was induced to resign all idea of completing his education, and as a means of support to go upon the stage. He made his début at the Birmingham theatre in June of that year as Romeo, and by industry and careful study soon acquired a respectable position upon the provincial boards. Gradually rising in his profession, he made his first appearance before a London audience at Covent Garden theatre, Sept. 16, 1816, as Orestes in Phillips's tragedy of the "Distressed Mother," and was pronounced by Hazlitt "by far the best actor that had come out in his remembrance, with the exception of Mr. Kean." From that time forward he continued, notwithstanding the presence of such great actors as Kemble and Kean upon the stage, to rise steadily in the public estimation, until he was generally recognized as the first of English tragedians. Among his most successful personations aside from the Shakespearian plays were Virginius, Caius Gracchus, and William Tell in Knowles's dramas, Melantius in the "Bridal," Rob Roy, Gambia, Werner, Pierre, Richelieu, &c. As a delineator of Shakespeare's heroes he has attempted a wide range of characters, but has been most successful in Hamlet, Macbeth, Othello, Coriolanus, and Leontes. In 1826 he made a successful tour through the United States, and in 1828 visited Paris, where he was received with greater favor than had been accorded to Kean or Kemble, and by some French critics was pronounced second only to Talma. In 1837 he undertook the management of Covent Garden theatre, but retired at the end of the second season, and for two seasons commencing with 1842 he had charge of Drury Lane. As a manager he did much to elevate the standard of dramatic representations, and to relieve the theatre of the reputation for immorality and profligacy with which in the opinion of many it was identified. The performances were artistic and appropriate, and in matters of costume, scenery, and the various accessories, in advance of those familiar to English theatres. The enterprise nevertheless was peculiarly unsuccessful in both instances; and in retiring from the management of Drury Lane, Mr. Macready stated that his actual loss during his connection with that theatre amounted to £8,000. In 1848-'4 he again played a series of engagements in the United States, which he revisited for the last time in 1848, previous to taking his farewell of the stage. In consequence of a misunderstanding of some years' existence between Mr. Edwin Forrest and himself, the friends of the former actor threatened to prevent the appearance of Mr. Macready in New York. He nevertheless played for a number of nights at the Astor Place opera house in that city in Oct. 1848; but upon commencing a farewell engagement there in the succeeding May he was menaced by se-

rious opposition. On Monday, May 7, when he appeared as Macbeth, such was the confusion prevailing in all parts of the house that the manager was obliged to order the curtain to fall before the termination of the performance. Mr. Macready was thereupon inclined to resign his engagement; but upon the publication in the newspapers of a card signed by many citizens, requesting him to remain, and promising to protect him in the discharge of his professional duties, he consented to reappear on the following Thursday. On that evening, owing to the precautions taken to preserve order in the house, he succeeded in performing his part, Macbeth, and at the end of the play was called out by the audience, whom he thanked for their protection and support. Outside of the theatre the friends of Forrest, after vainly endeavoring to effect an entrance, commenced an attack upon the building with stones and other missiles. The police being unable to restrain the mob, which was rapidly increasing in numbers and violence, and the reading of the riot act by order of the mayor proving ineffectual, the military were called out, and after several volleys of musketry, by which 22 persons were killed and 86 wounded, the riot was quelled. Though assured of ample protection, Mr. Macready determined to make no further attempt to act in New York, and soon after left the country. In 1850-'51 he performed a series of farewell engagements in England, and on Feb. 26, 1851, took a formal leave of the stage at Drury Lane theatre. On March 1 a complimentary dinner was given to him in London, which was attended by many men eminent in literature and art, and at which the chairman, Sir E. Bulwer Lytton, pronounced a high eulogium upon Mr. Macready as an actor, a manager, and a man. His rank as an actor is due principally to intelligent study, his genius being the reverse of impulsive, and his imagination not of that plastic nature which can instantly seize and embody impressions. Many excellent plays of Bulwer, Talfourd, Knowles, Browning, Marston, White, Taylor, and others, were brought out under his auspices; and his exertions to elevate his art and to depress whatever vicious tendencies may be connected with it have had a beneficial effect.

MACRINUS, Roman emperor from April, A. D. 217, to June, 218, born in Cæsarea, Mauritania, in 164. Of the humblest parentage, he was admitted into the employment of Plautianus, the favorite of Septimius Severus, and received successive appointments in the imperial household, until he became prefect of the prætorians under Caracalla. On the death of the latter, whose assassination he plotted, he was proclaimed emperor, gaining the favor of the prætorians by a liberal donative and of the senate by repealing some obnoxious taxes. He immediately marched against the Parthians under Artabanus, and was signally defeated by them near Nisibis. His enforcement of discipline caused disaffection among his troops, a portion of whom renounced their allegiance to

him in favor of the pretender Elagabalus. He marched against the latter, was defeated at Antioch, fled in disguise to Chalcedon, was quickly betrayed, and was put to death in Cappadocia.

MACROBIUS, **AMBROSIVS AURELIUS THEODOSIVS**, a Latin author, who lived in the early part of the 5th century of the Christian era. The place of his nativity is unknown, but the Hellenisms pervading his style indicate that he was a Greek. He wrote on history, mythology, criticism, physics, and metaphysics. One of the principal editions of Macrobius is that of Gronovius (Leyden, 1670).

MACTYEIRE, **HOLLAND NIMMONS, D.D.**, an American clergyman, born in Barnwell district, S. C., July 28, 1824. He was graduated at Randolph Macon college, Va., in 1844, and was then appointed professor of ancient languages and mathematics in that institution. After a year he entered the Virginia conference of the Methodist Episcopal church South, and was stationed at Williamsburg, Va., whence he was transferred in 1856 to Mobile, Ala. He preached in New Orleans for two years (1849-'51), at the expiration of which time he was called to the editorial chair of the New Orleans "Christian Advocate." In 1858 he was elected by the general conference editor of the central paper of the Methodist church South, the "Christian Advocate," at Nashville. He is the author of a prize essay on the "Duties of Christian Masters," which was published by the southern Baptist publication board, and which he subsequently revised and enlarged for the Methodist publishing house. He received the degree of D.D. in 1858 from the Wesleyan university, Ala., and from Emory college, Ga., the same year.

MACVICKAR, JOHN, D.D., an American clergyman and author, born in New York in 1787. He was graduated at Columbia college, N. Y., in 1804, and after spending some time in Cambridge, England, was ordained a clergyman of the Protestant Episcopal church, and in 1811 was settled over a parish in Hyde Park, N. Y. In 1817 he was appointed professor of moral philosophy, rhetoric, and belles-lettres in Columbia college, which position he still (1860) holds. He is the author of "A Domestic Narrative of the Life of Samuel Bard" (1822); "Outlines of Political Economy" (1825); "Early Years" (1834), a memoir of Bishop Hobart; "The Professional Years of Bishop Hobart" (1836); and of numerous essays, addresses, and occasional publications.

MACWHORTER, ALEXANDER, D.D., an American Presbyterian clergyman, born in New Castle co., Del., July 15, 1784, died in Newark, N. J., July 20, 1807. In 1756 he entered the junior class in the college of New Jersey, then at Newark, but removed the next year to Princeton. He began the study of theology immediately after graduating, was licensed to preach by the presbytery of New Brunswick in 1758, and in the following year was installed pastor of the church in Newark, which office he retained with some interrup-

tions for nearly half a century. In 1764 he was appointed by the synod of New York and Philadelphia to a mission in North Carolina, where his friends were settled, and where he had spent some years of his youth; he remained there about a year, and after visiting Boston returned to Newark in 1766. In 1775 he was appointed by congress to visit the western counties of North Carolina to persuade the numerous royalists there to adopt the patriot cause. Near the close of 1776 he hastened to the army encamped on the Pennsylvania shore, opposite Trenton, to consult concerning the protection of New Jersey, and was present at the council of war which advised the passage of the Delaware and the surprise of the Hessians. At the solicitation of Gen. Knox in 1778 he accepted the chaplaincy of his artillery brigade, and enjoyed friendly relations with Washington during the few months that he held this office. In 1779 he accepted a pastorate and the presidency of Charlotte academy, in Mecklenburg co., N. C.; but the place being captured by Cornwallis, he lost his library and furniture, and, fearing further attacks, was recalled and reinstalled at Newark. In 1788 he was prominent in settling the confession of faith and forming the constitution of the Presbyterian church of the United States. Dr. McWhorter was for 85 years a trustee of the college of New Jersey; and after the burning of the college buildings in 1802, the collection of funds for a new edifice was chiefly due to his influence and personal solicitations in New England. In 1800 he published a century sermon, describing the settlement and progress of the town of Newark, and in 1803 a collection of sermons in 2 vols. 8vo.

MADAGASCAR, the largest and most important of the African islands, situated in the Indian ocean, between lat. 12° and 25° 40' S. and long. 43° 10' and 50° 30' E., separated from Africa by the Mozambique channel, which is in its narrowest part about 800 m. broad; length of the island, from Cape Amber in the N. to Cape St. Mary's in the S., 937 m.; average breadth 250 m., greatest breadth (in the centre) about 350 m.; area estimated at 240,000 sq. m.; pop. about 3,000,000. The name Madagascar seems to be of foreign origin, the natives having no distinct appellation for the whole island. The sea coast contains many excellent harbors, among which are Diego Saurez bay or British sound, near the N. E. end of the island, and Port Loquez, Antongil bay, and St. Luce bay, on the E. coast. Tamatave and Foulle Pointe are, however, the most frequented ports on the E. coast, but they are only open roadsteads protected from the surf by coral reefs. On the W. coast are St. Augustine's bay, Tolia bay, Boiana, Bambetoka, Majambo, Nareenda, Pasandava, and Chimpaykee. Of these, St. Augustine's and Bambetoka are the most frequented. Close to the N. shores of Madagascar are several small islands, the chief of which are St. Mary's, 81 m. long and 3 broad, on the E. coast, and Nossibé, which is somewhat larger, on the N. W. coast.

Both of these are occupied by the French. The N. coast of Madagascar and some parts of the S. E. coast are lofty and precipitous; but generally the shore is a low plain, varying in width inland from 10 to 100 m., the breadth being greatest on the W. side. Beyond this plain the country rises gradually, till in the interior the table-lands reach an elevation of 6,000 feet above the sea. There are several great mountain ranges running from N. to S., the highest peak of which, Ankaratra, is computed to be 12,000 feet above the sea. The island abounds in rivers, some of which are between 100 and 200 m. in length. The largest are the Ikiopa, Mau-siatra, Matetanana, Mangoro, Sambaho, and Betsibooka, most of which discharge on the W. coast. The Sambaho and Betsibooka are said to be navigable for boats 150 m. from the sea. The mouths of most of the rivers, however, are obstructed by sand bars, and they are little used for navigation. Along the E. coast is a series of extensive lakes, which at intervals communicate with the sea. Some of these are 100 m. in length. The principal are Sariviaka, Imania, Imangora, and Itasy. Springs are numerous in the interior of the island, and many of them are medicinal. There are warm springs and salt springs, of which however, from superstitious prejudices, no use is made.—The climate of Madagascar is exceedingly diversified, both in regard to temperature and to salubrity. In the low lands and on the coast the heat is intense; but in the elevated interior the mercury seldom rises above 85°, and on the mountain summits ice is sometimes formed. The coast region with few exceptions is extremely unhealthy, and affects with equal injury the natives of the interior as well as Europeans. The rank luxuriance of the vegetation and the abundance of stagnant water produce a miasma, exposure to which causes a deadly fever. The highlands of the interior are exempt from this scourge, and are remarkably healthy. Of the geology of the island few details are known. The hills between the E. coast and the interior seem to consist of primary rocks; gneiss, granite, and quartz are found, and also basalt and large beds of clay. In other parts slate and limestone have been seen. Excellent iron abounds in the interior, where one of the elevations is called by a name signifying "iron mountain." Coal is found in the northern parts, and copper and other metals are said to exist, but of this nothing is known with certainty. A great part of the island is covered with dense forests, abounding with valuable timber suitable for ship building, carpentry, and cabinet work. Among the trees are ebony and a species of mahogany. The botany of the island is exceedingly rich, and is yet mostly unexplored. Among the plants peculiar to it is the "traveller's tree," so called because at all seasons its trunk, when an incision is made, yields a cool, sweet, and wholesome beverage. Its wood is also used in the construction of dwellings, and for many domestic purposes. Other valuable trees are the ravina-

la, the fotibe, the filao, the baobab, which abounds on the W. coast; the ampaly, whose hard leaf is used to polish wooden ware; the avoha, from which coarse paper is made; the *tapia edulia*, on which a native silkworm is extensively reared; the tamarind, the aviary and other species of fig, the vakoa, the dragon-tree, and the bamboo. The azaina is used for canoes, which are made by scooping out the trunk; it yields a great quantity of yellow juice, very adhesive, and used by the natives as glue. The voahena, which furnishes gum elastic, is abundant. Madagascar produces rice, which is the principal food of the people, tobacco, sugar, cotton, indigo, and various spices; also cocoa nuts, breadfruit, plantains, bananas, yams, pine-apples, peaches, oranges, and a great variety of tropical and temperate fruits. The potato is extensively cultivated, and the coffee plant has been introduced and thrives well. Domestic poultry of all kinds is reared in profusion. It is said that in the wildest part of the island a peculiar species of bird of enormous size exists, which is supposed to have given rise to the story of the fabulous roc of the Arabian romances. Cattle, both wild and tame, are numerous, and there are a few sheep and pigs in some districts. In the forests are wild hogs, wild dogs and cats, baboons, monkeys, foxes, and squirrels. There is also a remarkable animal peculiar to the island, called the aye-aye. It is a species of lemur, and is described as having large and round eyes, thin and broad ears, and a thick bushy tail. Its color is brown, and it is nocturnal in its habits. It is very rare, and the natives regard it with a sort of superstitious feeling. The rivers of Madagascar swarm with crocodiles, which are sometimes found 20 feet in length. They are fierce and dangerous, and destroy many cattle, and sometimes even men. The natives regard them with veneration, and never dare to injure them even in self-defence. Serpents of great size are found, though few are venomous.—Madagascar forms one kingdom, and is divided into 22 provinces, which were formerly independent states. Of these provinces the principal are Vohimarina in the extreme north; Tamatave and Betanimena on the E. coast; Matetanana on the S. E., settled in part by Arabs, and famous for its diviners and magicians; Anosy in the extreme S. E., fertile and populous, and the site of the most extensive French settlements; Betsileo in the interior, the people of which are noted for the mildness and simplicity of their manners; Menabe on the W. coast, inhabited by a race called Sakalava; and Ankova, the central and most important province, the seat of government and the native country of the Hovas, the dominant people of the island. Ankova contains Tananarivo, the capital of Madagascar and the only considerable town, with a population of about 25,000. The Madagascans, or Malagashes or Malagasy, as they are generally termed, are not of one race, but are evidently derived from a variety of stocks. The two great divisions of the people

are into black and olive. The olive race is distinguished by a light, exquisitely formed person, fair complexion, and straight or curling hair; while the black race is of more robust form, and has woolly hair. Beside these two great ethnological divisions, the population of the island is distinguished into 4 great political or geographical sections; these are the Hovas, the Sakalavas, the Betsileos, and the Betanimenas. The Hovas have within half a century made themselves masters of the whole island. In person, they are generally below the middle stature; their complexion is a light olive; their features rather flat than prominent; their lips occasionally thick and projecting, but often thin as in the Caucasian race; their hair is black, but soft, fine, and straight or curling; their eyes are hazel, and their figures erect and well proportioned. They are remarkably active, but have less bodily strength than the black tribes. The Sakalava during the last century were the dominant nation, and held the Hovas in subjection. Physically they are considered the finest race in Madagascar. They are tall and robust, and their limbs well formed, muscular, and strong. Their features are regular, their eyes dark, and their hair black, shining, and crisped or curly. Their complexion is blacker than that of any other people in the island. In war they are bold, energetic, and resolute; in peace they are indolent, and much addicted to sorcery and other superstitious practices. They are friendly to Europeans, evince a strong desire for improvement, and are said to exhibit ample proofs of mental powers capable under proper culture of the highest attainments. They are more numerous than the Hovas, and occupy the N. and W. coasts. The Betsileos are low in stature, slender in figure, erect and nimble in their movements. Their color is dark, though some are of light copper complexion. Their lips are thick, their eyes hazel, and their hair black, long, and curling. They are a modest and unassuming people, inferior to the Hovas in energy and enterprise, but peaceful and laborious cultivators of the soil. The Betanimenas are taller than the Betsileos, and are next to the Hovas the fairest people in the island. Their hair, though not always black, is generally frizzly. They are peculiarly distinguished for cleanliness in their houses and apparel, but are reputed to be of lower morals than any other portion of the people. On the E. coast a small part of the population is descended from the Arabs, who for centuries have traded to Madagascar. The Rev. William Ellis, whose works contain the fullest accounts of Madagascar, remarks of the people: "Their mental faculties, though in the majority of cases deteriorated by sensuality, enfeebled and cramped in their exercise by the juggleries of divination and sorcery and the absurdities of superstition, are yet such as to warrant the conclusion that they are not inferior to other portions of the human race; that if liberated from the debasing trammels by which they are now confined, and favored

with enlightened and generous culture, they are capable of high mental excellence. Among the dark-colored race the Sakalavas manifest the greatest intellectual vigor, uniting a remarkable quickness of perception with soundness of judgment. . . . With less that is sprightly and prepossessing in manners and address, the dark-colored tribes possess more that is commendable and amiable in social life; and there are among them more straightforwardness and honesty than in the fairer races. The latter, with the exception of the Betsileo, exhibit, with but few traits of character that can be regarded with complacency, much that is offensive to every feeling of purity and every principle of virtue. They are often, probably under the influence of superstition and revenge, coolly and deliberately cruel toward the vanquished in war; they appear to be naturally vain, self-complacent, and indolent, unless when roused to effort by ambition, avarice, revenge, or lust; ambition and a love of domination appear inherent." They are said, however, to be faithful in their friendships, and toward strangers they exercise a prompt and cheerful hospitality. Among neighbors a remarkable degree of kindness is shown by lending money or property, and by assisting those who are in distress. Duplicity is a general trait of character, and lying is not regarded as a vice at all. In fact, a serious and public complaint was once made against the preaching of Christianity on the ground that it taught the people to scruple at telling lies even to deceive their country's enemies. Infanticide is practised to a considerable extent, the victims being chiefly those who are born at hours and on days pronounced unlucky by the astrologers. Polygamy is permitted, limited only by the restriction that no man may take 12 wives excepting the king. There is also an almost unlimited facility of divorce on the part of the husband. Circumcision is practised, but rather as a political than a religious ceremony, being regarded in some respects as an initiation into the rank, privileges, and obligations of manhood and citizenship, and in some sense as a transfer of the subjects from the jurisdiction of the parent to that of the king. The rite is performed on a large number of boys at once by order of the sovereign, and at a time fixed by him. Slavery has existed in Madagascar from a very early period. Captives taken in battle and tribes conquered in war were reduced to bondage, and their descendants generally still remain in that state. Free persons also sometimes become slaves by their own act, by selling themselves for a subsistence, when reduced to absolute poverty. A father may also sell his children into slavery in certain cases. Many are made slaves by the sentence of the judges or the edict of the sovereign. Slavery is considered the heaviest penalty of the law next to capital punishment. It is always attended with confiscation of property, and involves the wives and children of the person on whom it is inflicted. Some of the nobles

have many hundred slaves. The master has absolute power, except that death can only be inflicted by order of the king. Between the slaves and the freemen there is an intermediate class, composed chiefly of those who labor for the government, especially those employed in felling timber or in burning charcoal. In one of the great forests near the capital, the woodcutters, called the "twelve hundred," though their number is really 2,000, are employed through life in felling and preparing for building or other purposes timber for the government. They build their huts and rear their families in the recesses of the forest, and cultivate enough land to yield them a scanty subsistence. Their male children are regarded as woodcutters from their birth, and labor at their vocation without any pay whatever; and were any of them to abandon their occupation, they would be pursued and treated as criminals or deserters. The smiths or general workers in iron, the gunsmiths and spear makers, carpenters, tailors, and in short all other workmen employed by the king, are expected to labor for life without wages, and to provide for the support of themselves and their families. There is a class inhabiting the eastern districts, the Bezanozano, who are required to carry all merchandise or other goods for the sovereign from the coast to the capital, a distance of 800 miles, without pay.—The Madagascans are generally remarkably hospitable. Whenever a stranger in the course of his journey enters a village, a present is brought him of rice, poultry, and fruit, or whatever other refreshment the place affords. If he approaches a house and the owners are within, he is cordially invited to enter, and treated with the utmost attention and civility. Vegetables of all kinds are abundant, and cattle and poultry are exceedingly plentiful and cheap. Locusts, of which large swarms appear in the spring and summer, form an important article of food. They are gathered in baskets by the women and children, and after the legs and wings have been picked off they are partially boiled, dried in the sun, packed in baskets, and carried to market. An equally singular article of food is the silkworm in its chrysalis state, which is cooked and eaten in some provinces. But the most important and general article of support is rice, which is native to the island. To eat rice, in Madagascar, signifies to take a meal. Next to rice, the most valuable kinds of food are the maize, the manioc, arrow root, and several varieties of yam, together with a number of European vegetables which have been recently introduced. The people eat with their fingers, and wash their hands and clean their teeth carefully after each meal. They are temperate in drinking, and water is almost the universal beverage, though a distilled spirit called *toaka* is occasionally used as a luxury. Ardent spirits are prohibited at the capital, and drunkenness is almost unknown except at the seaports frequented by Europeans. Tobacco is extensively cultivated, but is not smoked; it is mixed with other herbs and made

into snuff, which is taken, not into the nose, but into the mouth. The *rongona* or native hemp is smoked in pipes made of reeds. The favorite amusements of the Madagascans are fishing, hunting wild cattle, bull-baiting, cock fighting, and a game called *katra* somewhat resembling draughts. The people are extremely fond of music, both vocal and instrumental, though they have not yet made much progress in either. They have, beside the drum, two native instruments of music, the *valiha* and the *lokanga*. The former is a bamboo having 8 small slips cut from its rind between two of its joints, and then by means of small pieces of wood, used as bridges in a violin, elevated about a quarter of an inch. The player holds the instrument before him, and uses both hands in twitching the cords. The music thus produced is soft and plaintive; the tunes are few, short, and extremely monotonous. The *lokanga* is made of a piece of wood notched at one end so as to form 3 or 4 rests for the cord or string. One string is stretched upon it and attached to the head of a hollowed calabash. The music it affords is feeble and dull. The women sing in chorus with much skill and effect, and the villagers often assemble and pass the evening in singing and dancing.—The dress of the Madagascans is uniform and simple. It consists generally of 2 and at most of 3 garments, which are chiefly of hemp or cotton, varied among the slaves and poorer classes by a cloth inferior to either of these, and manufactured from the bark of the rofia, the banana, and some other trees; and among the rich by silk or foreign cassimere and broadcloths. One of these garments is the *salaka*, a piece of cloth about a yard in width and two yards long. This is fastened round the loins, passing under the body, and having the extremities in front reaching to the knees. The women wear a cloth called *kitamby*, of the same materials as the *salaka*, but considerably broader. It is worn round the person immediately below the breast, and reaches nearly to the feet. But the most important and characteristic part of the native dress is the *lamba* or mantle, which varies in dimensions and quality with the rank and circumstances of the wearer. It is worn by both sexes and all classes, both adults and children; for adults it is usually 3 or 4 yards in length and 2 or 3 in breadth. The royal *lamba*, which is held in the highest estimation, is of fine scarlet English broadcloth, bordered and richly ornamented with gold lace. It is worn by the king on sacred festivals and other state occasions. The use of a dress entirely scarlet is the exclusive privilege of the king, to whom is restricted also the distinction of using a scarlet umbrella. The *lamba* is worn by all classes over the shoulders, whence its folds hang loosely, reaching nearly to the ankles, the ends being drawn together in front of the wearer. On the persons of the men it is adjusted so as to hang principally over the left shoulder; as worn by the women, over the right.—The Madagascans are remarkably fond of peddling and

of frequenting public markets, which are held every day in the week in the neighborhood of the large towns, and at which vast multitudes assemble. Foreign commerce has long been carried on with the Arabs from Muscat and with traders from the W. coast of India, who brought raw silk, cloth, powder, trinkets, and other articles to the port of Mojanga on the E. side of the island. American vessels for many years past have resorted to the same port to exchange cloth, hardware, furniture, powder, and firearms, for hides, beef, and guma. A similar trade is maintained with Mauritius and the Cape of Good Hope.—The government of Madagascar is a despotism, modified and tempered by customs and usages which have the force of law. Of late years, however, the military force at the command of the sovereign has so much increased, that there is little or no practical check upon the royal authority. The succession to the crown is hereditary in the royal family, but not in the direct line of descent, for the reigning sovereign designates at pleasure his successor without regard to the strict rules of inheritance. Females are not excluded from the throne, the present ruler being a queen. The nobles or *andriambavanti*, who rank next to the members of the royal family, also fulfil the functions of judges. Their number is not fixed, but usually there are about 12 residing at the capital. Their business is to hear causes and decide by what appears to them the equity of the case. The officers of the army constitute also a powerful and well organized aristocracy. Rank among them is conferred by number from one up to 13. A colonel, for example, is a noble of the 9th honor, a general of the 11th, and a field marshal of the 13th. The army is large, well armed, and disciplined in the European manner. The revenues of the government arise from taxes, duties and customs, fines and confiscations. They are not large, but the property belonging to the crown is considerable, and the practice of using the services of the subjects without paying for them precludes in a great measure the necessity of a large money revenue.—The religion of the Madagascans is a rude and confused idolatry, accompanied by a vague belief in a supreme God, whom they call *Andria-manitra*, "the prince of heaven." The people worship 12 or 15 principal idols, belonging respectively to different tribes or classes, of whom they are supposed to be the guardians or tutelary gods. Four of these are superior to the others, and are considered public and national. Little is known, however, of these idols, as it is considered injurious to endeavor to obtain a sight of them. The only one of which foreigners have obtained correct information is a piece of wood cut into a rough imitation of the human figure. The names of the two greatest idols are *Rakelimalaza* and *Ramahavaly*. They are kept each at small villages about 7 miles from the capital, where they are lodged in houses resembling the common dwellings of the people, there being no temples

in Madagascar, and no priests except the men who have charge of the idols. The Madagascans are much addicted to divination, which they practise in a systematic manner according to certain definite rules, with the help of beans, rice, straw, sand, or any other object that can be easily counted or divided. They also cast nativities and foretell fortunate days, regarding however, in their calculations for this purpose, not the stars, but the moon and its phases. The custom of trial by ordeal also prevails extensively among them, principally by causing the accused to drink a decoction of a poisonous fruit called the *tangena*, a small dose of which acts as an emetic, while a large dose is generally fatal. By skilfully managing the size of the dose, those who administer it have it in their power to decide the result.—The Madagascans have no records of their own history, but from their traditions and usages there is reason to believe that none of the races now existing in the island were its primitive inhabitants. An extinct race called the Vazimba seem to have preceded the present population. Nothing is known of them except that they dwelt in the interior, and at a remote period were conquered by invaders and in time exterminated. The existence of the island was first made known to Europeans by Marco Polo in the 13th century. He did not visit it, but gathered in Asia some vague idea of its extent and position. It was discovered in 1506 by Lorenzo Almeida, son of the first Portuguese viceroy in India. The Portuguese not long afterward made a settlement on the banks of the river Franchere in the province of Anosy, but their colony was soon massacred by the natives. The French in 1642 made an attempt to possess themselves of Madagascar, and settled a colony in Anosy. Several expeditions were subsequently sent thither, and for some years the French had considerable influence in the southern provinces, and claimed sovereignty over the whole country; but the climate and wars with the natives eventually compelled them to abandon the island. In 1642 the English had a fort at St. Augustine's bay, with a garrison of 200 men, of whom one fourth died of fever in two years, and the settlement was soon broken up. For a considerable period Madagascar was not molested by Europeans, till about the beginning of the 18th century the island became a favorite resort of pirates, among the first of whom was the famous Capt. Kidd. In time the pirates, led by a Frenchman named Misson, formed a settlement and a sort of commonwealth, which they called Libertalia, on the N. E. coast. After committing great depredations, these buccaneers were suppressed by powerful naval forces sent against them by several European governments. About 1745 the French East India company took possession of the island of St. Mary's on the E. coast, and made a settlement there, and in 1768 they established another colony at Fort Dauphin at the S. E. extremity of Madagascar. In 1774 the celebrated Hungarian adventurer,

Count Beniowsky or Benyovszky, undertook to conquer Madagascar, and for a time met with considerable success; but his plans were frustrated by his violent death in 1786. At the beginning of the present century Madagascar was divided into a number of independent states, one of the most powerful of which was the kingdom of Imerina, a subdivision of Ankova, the country peopled by the Hovas. In 1808 Radama (born in 1792), the descendant of a long line of kings, ascended the throne of Imerina on the death of his father Impoina. This able and ambitious monarch in 1816 was visited by British agents, whom he received with great favor, and with whom he formed a treaty in 1817, by which the slave trade was abolished on condition of an annual supply of ammunition and arms from the British government, which also sent men to instruct the native soldiers in military tactics. With the arms and discipline thus obtained, Radama in a few years was enabled to subdue the whole island. In 1818 the London missionary society sent a number of missionaries, accompanied by artisans to instruct the people in the useful arts. The native language was reduced to writing, a grammar prepared, and the Bible translated and printed. In the course of 10 years about 15,000 of the natives had learned to read, and a large number were converted to Christianity. Mr. Hastie, an Irishman sent by the British government as its agent, resided several years at the capital, where he had great influence. His counsels, which all tended to promote civilization, had much weight with Radama, who was strongly imbued with love of truth and justice, and was humane and gentle in character. The king gave all the encouragement in his power to the missionaries, and immense advances were made in civilizing the kingdom. Infanticide and a variety of other cruel customs were abolished, and rapid progress was made in the useful arts and in education. The premature death of Radama in 1828 put a stop to the advance of Madagascar in this direction. He was succeeded by his widow, Ranavalona, who soon exerted herself to undo the work of her predecessor. The schools were closed and the missionaries driven from the island in 1836. The influence of the idol-keepers and of the supporters of divination and other superstitions was restored to its former supremacy. The profession of Christianity by any of the natives was prohibited, and violent persecution of the native Christians commenced, in which many suffered martyrdom with heroic fortitude. In 1845 the foreign traders at Tamatave were ill-treated, and appealed for assistance to the English governor at Mauritius and to the French governor at Bourbon, who sent one English and two French men-of-war to Tamatave. After fruitless conferences and attempts at negotiation, the Europeans bombarded and burned the town, and landed to attack the fort, but were repulsed by the natives with considerable loss. From this period all amicable intercourse between the French and English and

the Madagascans ceased for 8 years, till in 1858 commercial relations were renewed by the payment of an indemnity to the queen of the island. In 1846 the queen's son, then 17 years of age, embraced Christianity; and through his influence Christian doctrines were more widely spread than ever in Madagascar. In 1849, however, a fresh persecution broke out, and more than 2,000 persons were arrested and punished for their faith, some of them with death. In 1857 a conspiracy organized by French emissaries for the overthrow of the queen's government led to another persecution of the Christians, in which 2,000 persons were put to death. In 1859 the French made another settlement at Bally on the E. coast, under pretext of a cession of territory by a native chief who assumes to be independent of the queen. The latter, however, claims sovereignty over the whole island. —The Madagascan language belongs to the Malayan or Polynesian family of languages. Its close relation to the dialects of New Zealand, the Society and Sandwich islands, is shown not only in the signification of words of the same sound, but in the arrangement and grammatical structure of the language; though from Madagascar to Easter island, the extreme limit eastward of the Polynesian tongues, extends a space exceeding by 20 degrees of longitude half the circumference of the globe. From Africa, on the other hand, though separated only by a comparatively narrow channel, Madagascar seems to have received very few words. The following examples will be sufficient to show the strong similarity between the Madagascan and the Tahitian: Madagascan *tany*, Tahitian *tana*, land; Mad. *lanit*, Tah. *lani*, sky; Mad. and Tah. *mata*, the human face; Mad. *nio*, Tah. *niu*, the cocoanut tree. In Madagascan the numerals from one to ten are *isa*, *roa*, *telo*, *efatra*, *dimy*, *enina*, *fitu*, *valo*, *sivy*, *folo*; in Tahitian, *tahi*, *rua*, *toru*, *maha*, *rima*, *ono*, *hitu*, *varu*, *iva*, *huru*. The copiousness, precision, and philosophical structure of the Madagascan language render it probable that it was derived originally from a tongue spoken by a civilized people. Sir Stamford Raffles, in his "History of Java," remarks: "One original language seems in a very remote period to have pervaded the whole Indian archipelago, and to have spread, perhaps with the population, toward Madagascar on one side and the islands of the South sea on the other. . . . In proportion as we find any of these tribes (from Madagascar to the South sea) more highly advanced in the arts of civil life than others, in nearly the same proportion do we find the language enriched by a corresponding accession of Sanscrit terms, directing us at once to the source whence civilization flowed toward these regions." A considerable number of Arabic words are found in Madagascan, among them the names of the days of the week, of the months, and the terms used in divination and sorcery. These have doubtless been introduced by the Arab traders who from time immemorial have visited the coasts

of the island. Throughout Madagascar one language prevails, though varieties of dialect exist, the speech of the interior being slightly different from that of the coast in pronunciation; the letter *l*, for example, being frequently used on the coast where *d* is employed in the interior, as in *oly*, a charm, which in the interior is *ody*. The structure of the language is simple and easy, but it admits both of great force and elegance of expression. It is so copious that there are as many as 20 different words to express the various modes in which the horns of a bullock grow, up or down, straight or crooked, &c., and about 80 names for the different modes in which the natives plait their hair. It readily admits of a vast variety of compound words, and has great facility of forming numerous derivatives, agreeably to fixed rules, from one simple root, which derivatives convey shades of meaning that in other languages are expressed by cumbrous phrases; for example, *mody* is "to go home;" *tampody*, "to go out and return home the same day." The Rev. Dr. Griffiths, in his grammar of the language, the latest published, states that some single roots will produce 200 words of different orthography and signification. The English missionaries, who reduced the language to writing in 1817, adopted the Roman characters. The alphabet consists of 21 letters, the *c*, *q*, *u*, *v*, and *s* of the English alphabet being omitted. *G* is always hard, as in *go*; *c* is expressed by *s* or *k*, *u* by *io*. The vowels are pronounced as in the languages of continental Europe. For the sake of euphony, in speaking, several of the consonants are changed when they follow other consonants; thus *f* changes into *p* after *m*; *h* into *k* after *n*; *l* into *d* after *n*, and *t* into *d* after *n*; *v* into *b* after *m*, and into *d* after *n*; *nr* assumes *d* and becomes *ndr*, and *t* is inserted after *n* before *s*. Every word ends with a vowel, which gives a peculiar softness and harmony to the language. There is but one article, *ny*, the. The noun without the article is indefinite. The nouns admit of no inflections to signify number, case, or gender. Case is indicated by the position of the noun in the sentence, or by the use of prepositions, and gender is determined by the addition of the word *lahy* for male and *vaov* for female. Adjectives are not numerous, and they admit of no inflection. Many are formed by affixing *ma* to the roots; as *loto*, filth, *maloto*, dirty; *dio*, purity, *madio*, pure. They usually follow the noun, as *trano avo*, house lofty; *rano marivo*, water shallow. The comparative is formed by adding the word *noho*, as *tsara*, good, *tsara noho isy*, better than he; or by repeating the positive and adding *koko*, as *tsara tsara koko*, better. The superlative is formed by adding *indrindra*, exceedingly, as *tsara indrindra*, best. Some classes of pronouns are numerous, especially the demonstrative, which add greatly to the precision of meaning by pointing out definitively the position, nearness, or distance of the persons or things spoken of. The moods of the verbs are

the indicative and the imperative, the subjunctive and potential being formed of the indicative with parts of the auxiliary verb. The tenses are past, present, and future. Additional tenses expressive of more definite time than past and future are formed by certain particles and parts of the substantive verb. The tenses are formed by the change of the initial letters and auxiliary particles. The Madagascans have as yet no native literature, all the books in their language having been written by foreigners, who seem to have found no difficulty in expressing any ideas they wished to convey.—See "History of Madagascar," by the Rev. William Ellis (3 vols. 8vo., London, 1838), and "Three Visits to Madagascar," by the same (London and New York, 1859).

MADAME (Fr. *ma* and *dame*, my lady), a French title, originally applied only to female saints and ladies of quality, but now common to all married women of whatever rank or condition. Under the old French monarchy the daughters of the sovereign received this title at their birth, and were designated Madame Elisabeth, Madame Victoire, &c., the eldest only being called simply Madame. It applied more particularly perhaps to the wife of Monsieur, the king's eldest brother, or to the eldest daughter of the dauphin, by but one of whom, however, it could be borne at a time. The daughters of the king's younger sons and of his brothers and uncles were called mesdemoiselles, the one taking precedence of the others in rank or birth being Mademoiselle.

MADDEN, SIR FREDERIC, an English antiquary, and one of the principal officers of the British museum, born in Portsmouth in 1801. In 1825 he was employed to assist Mr. Roscoe in preparing a catalogue of the MSS. belonging to Mr. Coke (now earl of Leicester of Holkham), and from 1826 to 1828 was engaged in the British museum to assist in compiling the classed catalogue of printed books. He then became assistant keeper of the department of MSS., and in 1837 succeeded to the keepership. He has published many works relating to literary antiquities; among them are editions of the romances of "Havelok the Dane" and "Sir Gawayne," the Saxon poem of "Layamon's Brut," Wycliffe's Bible, "The Privy Purse Expenses of the Princess Mary," and the letterpress to Shaw's "Illuminated Ornaments selected from MSS. and Early Printed Books." He has also contributed many articles to the "Archæologia," among which one entitled "Observations on the Autograph of Shakespeare" attracted much attention, as supporting the authenticity of the celebrated autograph of the great poet found in a copy of a translation of Montaigne's "Essays."

MADDER, the powdered root of the *rubia tinctoria*, much used as a red dye. It was known and used by the ancients, and a correct description of the plant is given by Dioscorides under the name of *oreuthodanon*. The plant belongs to the natural order *rubiacæ*, is a native of the south

of Europe, and is largely cultivated in France, Asia Minor, and Holland, and also in some parts of the United States, especially in Delaware and Ohio. The roots are perennial, but the stalks are annual. The latter are slender, of quadrangular form, jointed, growing only a few feet in length, and furnished with prickles, by which they are held in climbing upon other plants. The branches proceed in pairs from the joints; they bear at the points where they subdivide a number of elliptical, pointed, rough leaves, and terminate in a spike of yellow flowers. The fruit is a round black berry. The roots, proceeding from a central head, are long succulent fibres. Those esteemed the best for dyers' use are from the size of a goose quill to that of the little finger, and of the 2d or 3d year's growth. When stripped of the dark bark which covers them, they appear semi-transparent, are of a reddish color, and possess a bitter taste and a strong peculiar odor. The plants are propagated by shoots, which are planted in August about a foot apart, and left to grow for two years being kept free from weeds. They are also raised from seed; and as the madder of hot climates affords more coloring matter and of a deeper tint than that of colder regions, it is well to procure the seed for northern localities from the south. When the roots are dug, they are dried in the air and in kilns, threshed with a flail to remove the outside, and several times winnowed and sifted with sieves of increasing fineness; the dust and sand which pass through the last sieve are rejected, and the fibrous portions which remain are further cleaned and assorted. The coarsest fibres are esteemed the best. They are again dried in stoves until they break easily when squeezed in the hand; and after this they are cut up by a machine furnished with knives, and then ground between millstones, and the powder is bolted. In commerce the powdered roots only are called madder, the whole roots being known by the name of *lisari*; the variety called *mulle* or *bilon* is of inferior quality, consisting of the fibres and epidermis of the larger roots, earthy impurities, and the refuse from the sieves. The product of Turkey is all brought to Smyrna for shipment, and amounts annually to 50,000 or 60,000 sacks of 2½ cwt. each. The best varieties are those from Bakir, Allazata, and Cayagik. At Smyrna the roots are garbled and packed by means of hydraulic presses into bales of 6 to 7 cwt. each. The annual product varies with the prices, the growers refusing to dig the roots when the price is low, and when this is high they often take them up when they are only 2 years old. They should be in the ground 3 or 4 years, according to the sort. Bakir roots in 1860 were worth in Smyrna 46s. 6d. per cwt., and other roots from 39s. to 45s. 6d. per cwt. The European madders are distinguished as Dutch, Alsatian, and of Avignon, or of the Comtat. The qualities are very variable. Many sorts are prepared without removal of the epidermis, and are consequently of darker hue than those denominated "stripped."

The powders are improved by being kept from one to three years in the cask. They undergo in this time a process of fermentation, the particles agglomerating and expanding, often with sufficient force to cause the heads of the casks to swell out. The madder becomes so hard that it can be removed only by cutting it out with chisels. From analyses of the ashes of madder made in Lowell, Mass., by Mr. Carnes, with the view of discovering the cause of the superiority of Avignon madders, which require no addition of carbonate of lime to increase the stability and brightness of their colors, as do the Turkey and American madders, it was found that the ashes contained 82.76 per cent. of this mineral substance, while those of the Turkey madder contained 18.85, and of the American madder, raised in Montague, Mass., 28.39 per cent. This fact, and that of the French madder effervescing when treated with dilute acid, which the others do not, led Mr. Carnes to the opinion that carbonate of lime was introduced into the French roots in the process of grinding; and he inferred that if the American were treated in a similar way, it would rank with the best madder in the world, for the colors obtained with it after it was treated with 4 to 6 per cent. of chalk were superior to those of the best French madders.—In dyeing, the common reds employed for cottons are prepared from madder, and in calico printing this dye is particularly convenient on account of the variety of tints it affords when used with different mordants. The composition of madder is exceedingly complicated from the great number of organic and inorganic substances it contains. Berzelius and Runge separated 5 coloring matters, which they designated as madder red, purple, orange, yellow, and brown; but others believe them modifications of 3 coloring principles, which by Dr. Sohunck and Mr. Higgins are described as a yellow, called xanthine, an orange, rubiacine, and a red, alizarine. Mr. Higgins regards the xanthine as convertible by oxidation into rubiacine, and this into alizarine, a change which takes place in madders kept for some time in the cask, thus improving their quality; and it is also the result of the process of dyeing when this is skilfully conducted by beginning at a low temperature, and gradually increasing the heat. An artificial preparation of madder, called garancine, has been largely manufactured in Avignon and Alsace since the discovery of the process by Robiquet and Colin in 1828. This substance Mr. Higgins found to be a very pure quality of alizarine. It is prepared by treating the pulverized madder with hot dilute sulphuric acid, and then washing it thoroughly with water; this being drained off, the madder is dried by steam heat and finally ground.—Madder is often adulterated, sometimes with earthy substances, the presence of which is easily detected by the grittiness of the article when chewed; but more frequently with saw dust, as of pine bark, mahogany, logwood, &c., substances that seriously impair its qualities as a dye, and are very diffi-

cult of detection and separation. Hence, to judge of the value of samples of madder, it is necessary to submit them to actual trial upon pieces of cloth prepared with different mordants in order to determine their tinctorial power and peculiar hues.—A singular property possessed by madder was first noticed by John Belchier, an English surgeon, in 1736, and subsequently attracted much attention from physiologists, especially Haller and Hunter. He observed that the bones of pork served at table were of a red color, and on investigation traced the cause to the hogs having been fed on bran which had been boiled with printed calicoes in order to brighten their colors. It was afterward ascertained that the color of madder was very rapidly deposited on the external portion of bones of animals that partook of the dye in their food. No point of ossification in the system escaped its action. Pigeons soon exhibited a red circle round the iris of the eye, where in birds there exists a circle of minute osseous pieces. Flourens in 1839, by a series of experiments upon pigs fed alternately with food mixed with madder and food free from it, was led to very interesting conclusions as to the manner of growth and absorption of bones, the former resulting from external accretion, and the latter taking place on the inner surface, except in the teeth, in which the operations are reversed. The milk of cows that feed upon it is stated to be tinged of a reddish color, which is imparted to the butter. But there is little ground for the opinion of Beckmann, that Virgil in his 4th Eclogue referred to madder under the name of *sandyx*, in the line: *Sponte sua sandyx pascentes vestiet agnos*, there being no authentic case recorded of either wool or hair made red by an introduction of madder in food.—The imports of madder into the United States in the year ending June 30, 1859, chiefly from France, were valued at \$2,156,408 for madder ground or prepared, and \$44,138 for madder root.

MADDER, INDIAN. See MUNJEET.

MADEIRA (Port. *madera*, timber, so called from its original thickly wooded appearance), an island in the N. Atlantic ocean, 800 m. from the coast of Africa, belonging to Portugal, of which kingdom it forms a province and integral part. Its E. point is in lat. 32° 44' N., long. 16° 38' W.; its W. point in lat. 32° 49', long. 17° 16'. In shape it is a parallelogram, about 38 m. in average length from E. to W., and 11 m. in average breadth. The area is 407 sq. m.; pop. in 1857, about 82,000, having been much decreased by emigration and the cholera. For municipal purposes the island is divided into 9 districts called *concelhos*. The capital is Funchal. A range of mountains traverses the island from E. to W., of which the highest summit, Pico Ruivo, is in the centre, and is 6,100 feet above the sea. On each side of the main chain ridges enclosing deep ravines run to the sea, where they terminate in bold headlands. The whole coast, with slight exceptions, is bounded by precipices of basalt, and the entire

island is little more than a huge basaltic rock. It is for the most part of volcanic origin, though there are now no symptoms of active subterranean fires. The general appearance of the country is exceedingly rugged, and the scenery of the grandest character of alpine magnificence mingled with landscapes of exquisite loveliness. "No artist's pencil," says an English writer, Mr. E. V. Harcourt, "has ever done full justice to the scenery of Madeira; what then can be expected from a bare description? There is an aerial magic in it which you must go thither duly to appreciate. The various colors of the soil, with mingled hues, black, yellow, red, and white, the vivid verdure, and the ever-changing shadows of the sky, give a warmth of tint and a diversity of effect which is characteristic and striking. Here is not the unintermitting blaze and eternal blueness of a tropical, nor the cold haze of a northern atmosphere; but the sunshine is broken and mellowed by flitting clouds, and a series of dissolving lights and shades surround you on every side, which must awaken pleasure and admiration in the breast of the most insensible." The climate of Madeira is singularly mild and equable, the mean annual temperature of Funchal being about 66°. The mercury has never been known to fall below 46°, and very seldom falls to 48°, while on the coast it scarcely ever rises higher than 80°. The average annual fall of rain is 80 inches, and of this quantity about one half falls in winter. There is usually a rainy period in September or October, and again in January. From January to June rain falls at intervals, but from June to September the weather is clear and settled. The island is much resorted to by invalids suffering from pulmonary disease. A distinguished physician, Sir James Clark, says: "When we take into consideration the mildness of the winter and the coolness of the summer, together with the remarkable equality of the temperature during the day and night, as well as throughout the year, we may safely conclude that the climate of Madeira is the finest in the northern hemisphere. That great and lasting benefit is to be derived by an invalid from a temporary residence in the climate of Madeira many living examples sufficiently prove." Mr. John A. Dix, in his "Winter in Madeira" (New York, 1850), says: "It is as a winter climate that Madeira is sought by invalids, and certainly no district or country can be found which, for dryness and moderate warmth combined, presents so many advantages. There is scarcely a day on which an invalid need be kept within doors during the whole 24 hours on account of rain; the sun is rarely too warm for exercise in the open air; and with an overcoat the cold is never uncomfortable. It would be difficult to find a climate within the reach of European or American invalids of which as much can be said."—There are no mines in Madeira, and the only metallic product is a little lead. The vegetable productions comprise maize, wheat, barley, sugar cane, arrow root, coffee, potatoes, sweet

potatoes, pumpkins, beans, cabbages, and onions. Among the fruits are the orange, peach, guava, fig, mango, pineapple, custard apple, granadilla, banana, and apples, pears, cherries, grapes, walnuts, and mulberries. There are extensive woods of chestnut on the mountains, producing great quantities of nuts, which form an important part of the food of the people. The island produces 80 or 90 plants peculiar to itself, but the greater part of the flora resembles that of the Canary islands and of the regions around the Mediterranean. The most remarkable forms of the indigenous vegetation are the dragon tree and a species of cactus, the latter of which exists in great abundance in the lowlands. The laurels, of which there are 4 kinds, are also conspicuous; and the juniper attains the height of 50 feet and yields a valuable scented wood. Madeira has no indigenous land mammals, but cattle, goats, horses, asses, rabbits, rats, and mice have been introduced since its discovery by the Portuguese. The horses are small, but active and hardy; they are used only for riding, oxen being employed for draught. The only bird peculiar to the island is a wren, but about 80 species breed there, among which are the kestrel, buzzard, and barn owl, the black-bird, redbreast, goldfinch, quail, partridge, woodcock, two kinds of swallows and three of pigeons, and the green Canary bird from which the domesticated species is derived. There are very few reptiles, and none poisonous; the most common is a small lizard. About 190 species of fish are found near the island, many of which are peculiar. Among them are the torpedo, the stag-horned horse fish, striped remora, flying fish, sword fish, trumpet fish, and several curious species of shark. About 1,200 species of insects have been enumerated, and about 119 species of shells have been found, of which 111 are peculiar to the island.—The people of Madeira are of mixed Portuguese, Moorish, and negro descent. The men are well formed and strong, with black hair and eyes; the women are generally far from handsome, though they have fine eyes and hair. The lower classes are gay, polite, respectful to their superiors, industrious, and capable of long continued labor; they are entirely uneducated. The upper classes are indolent, and have little intellectual cultivation, though they usually learn French or English so as to speak those languages. The morals of the natives are not very strict, illegitimate children being numerous. At Funchal there is a resident British population, which amounted in 1856 to 75 families and 295 persons. About 800 invalids annually visit the island, and reside there during the winter and spring.—The agriculture of Madeira is conducted in the primitive Portuguese manner, with very rude implements. Immense labor has been expended upon the soil in the erection of terrace walls to prevent the earth of the slopes of the hills and mountains from being washed into the sea by heavy rains; and in the construction of water courses to conduct the water of the mountain

springs to the cultivated land, to the fertility of which irrigation is essential. For nearly 4 centuries previous to 1852 the staple product of the agriculture of Madeira was the vine, which yielded the celebrated wine bearing the name of the island, of which the annual export averaged 5,000 pipes, each pipe containing 92 gallons. In that year disease began to infect the vines, which soon stopped the production of wine, and has at length nearly destroyed the vines themselves. The rearing of the cochineal insect has been introduced to give occupation to those thrown out of employment by the failure of the grape crop. The commerce of the island depended almost entirely on the wine, and was chiefly in the hands of resident British merchants. The entrances at Funchal (the only port) in 1855 were 75 British and 117 other vessels, and the clearances 77 and 107. The value of imports in 1855 was £110,210, and of exports £75,280. The customs duties on imports in 1855-'6 were £18,119, 16 per cent. more than in the preceding year. The imports of Madeira wine into the United States in the year ending June 30, 1859, were valued at \$55,000, about one third of which came direct from Madeira and the rest through France, Spain, England, and other countries. The chief imports of the island are manufactured goods, iron ware, grain, salt, and timber. Grain is imported from the Azores and from the coast of Africa. Two English sailing packets ply between London and Madeira, and a Portuguese packet brig runs between the island and Lisbon. Funchal also is a coaling station for the British mail steamers to Brazil and the African coast, which touch there once a month on the outward voyage and again on the return, and the Portuguese and French steamers to Brazil also touch there. The manufactures of Madeira are insignificant, consisting chiefly of baskets, straw hats, coarse linens and woollens, shoes, artificial flowers, sweetmeats, and some needlework embroidery made by the women for exportation.—The government of the island is in the hands of a civil governor appointed by the crown. The law is administered by two chief judges also appointed by the crown, but minor cases are decided by magistrates elected by the people. The island sends 4 deputies to the cortes at Lisbon, who are chosen by the male inhabitants who have incomes of \$100 a year. The Roman Catholic religion is established by law, but Protestants of foreign birth are allowed the free exercise of their religion. Funchal is the see of a bishop who has jurisdiction over 49 parishes, each with its church and resident priest. By law all children at a certain age should be sent to school, but the law is not enforced, and only a small part of the children receive education. In 1854 the number of pupils in all the schools was 2,710, and the amount expended by the government for education about \$6,000.—Belonging to Madeira, and about 11 m. S. E. from it, are 8 very small, rocky, and uninhabited islands, called the *Desertas*. The island of Porto Santo, also dependent on Madeira,

lies about 25 m. N. E., and is 6 m. in length by 3 in breadth. It is the seat of a lieutenant-governor, and in 1854 had 1,708 inhabitants, the greater number of whom live in a small town (the only one in the island) on its S. side. Porto Santo was discovered in 1419 by two Portuguese captains, who were accidentally driven there by a storm while on their way from Portugal to the coast of Africa. The next year an expedition sent out to colonize Porto Santo discovered Madeira, and settled there. Between 1580 and 1640 Madeira with Portugal itself belonged to the Spanish crown. In 1801 the island was garrisoned by British troops for 6 months to protect it from the French, and in 1807 it was taken possession of by the British, who held it till 1814.

MADEIRA, MADERA, or CAYARA, a river of Brazil, formed by the confluence of several rivers, the largest of which are the Guapore, Mamore, and Beni, taking its name at the junction of the last in lat. 10° 30' S., long. 65° 40' W. It flows N. E. for about 700 m., and falls into the Amazon, of which it is the largest tributary, in lat. 3° 30' S., long. 59° 10' W. During its course it receives a great many affluents, many of them considerable. It is navigable by small vessels for about 500 m. above its mouth; beyond that for about 200 m. it is obstructed by cataracts, of which there are 17. Its whole length, including the river Mamore, is about 1,500 m.

MADISON, the name of counties in 17 of the United States. I. A central co. of N. Y.; area, 670 sq. m.; pop. in 1855, 48,687. Oneida lake is on its N. border, and Owahgena or Cazenovia lake on the W. Its principal streams are the Unadilla and Chenango rivers, and Chittenango and Oneida creeks. The central and S. portions are hilly, the N. low and swampy. The productions in 1855 were 57,286 bushels of wheat, 571,637 of oats, 449,588 of Indian corn, 197,231 of barley, 224,278 of potatoes, 531,677 of apples, 68,268 tons of hay, 102,581 lbs. of flax, 1,840,298 of butter, and 2,087,594 of cheese. There were 21 coach and wagon manufactories, 22 grist mills, 75 saw mills, 94 churches, and 15,661 pupils attending public schools. The New York central railroad intersects the N. part of the county. Capital, Morrisville. II. A N. E. co. of Va., bounded N. W. by the Blue Ridge, and S. E., S., and S. W. by the Rapidan river; area, 276 sq. m.; pop. in 1850, 9,881, of whom 4,724 were slaves. Robertson's and Hazel rivers have their sources in the county. The surface is elevated and noted for its fine scenery. In the valleys the soil is fertile. The productions in 1850 were 136,684 bushels of wheat, 343,448 of Indian corn, 51,300 lbs. of tobacco, and 17,391 of wool. There were 27 grist mills and 16 saw mills. Value of real estate in 1856, \$2,140,567; increase since 1850, 17 per cent. Capital, Madisontown. III. A W. co. of N. C., bordering on Tenn., and intersected by French Broad river; area, about 450 sq. m. The county was formed in 1850 from Buncombe and Yancey cos., and is not included

in the U. S. census of that year. It has a hilly surface, lying on the S. E. declivity of Bald mountain. Capital, Marshall. IV. A N. E. co. of Ga., drained by branches of Broad river; area, 275 sq. m.; pop. in 1859, 5,891, of whom 2,096 were slaves. The surface is undulating, and the soil varies in fertility. It has some mineral springs, and contains gold, granite, and iron ore. The productions in 1850 were 195,421 bushels of Indian corn, 81,865 of sweet potatoes, and 2,219 bales of cotton. There were 11 churches, and 281 pupils attending schools. Value of land in 1856, \$618,526. Capital, Danielsville. V. A N. co. of Fla., bordering on Ga., and bounded E. by the Suwanee and Withlacoochee rivers and W. by the Ocala; present area, about 650 sq. m.; pop. in 1850, 5,490, of whom 2,688 were slaves. Since that census it has been reduced to less than $\frac{1}{4}$ its original size, Taylor and Lafayette cos. having been formed from it. The productions of the original county in 1850 were 63,680 lbs. of rice, 226 hhd. of sugar, 5,024 bales of cotton, and 46,320 galls. of molasses. Capital, Madison. VI. A N. co. of Ala., bordering on Tenn., bounded S. by the Tennessee river and intersected by Flint and Paint Rock creeks; area, 760 sq. m.; pop. in 1850, 26,427, of whom 14,826 were slaves. It has a hilly surface, and a fertile and well cultivated soil. The productions in 1850 were 1,195,037 bushels of Indian corn, 80,535 of sweet potatoes, and 20,888 bales of cotton. There were 13 grist mills, 18 saw mills, 43 churches, and 980 pupils attending schools. The Memphis and Charleston railroad intersects the county, passing through the capital, Huntsville. VII. A central co. of Miss., bounded W. by the Big Black river, and S. E. by the Pearl river; area, 720 sq. m.; pop. in 1850, 18,178, of whom 18,843 were slaves. The productions in 1850 were 785,485 bushels of Indian corn, 175,290 of sweet potatoes, 54,821 lbs. of rice, and 14,868 bales of cotton. There were 26 churches, and 526 pupils attending schools. The New Orleans, Jackson, and great northern railroad intersects the county, passing through the capital, Canton. VIII. A N. E. parish of La., bordered by the Mississippi river on the E., and intersected by the Tensas; area, 700 sq. m.; pop. in 1855, 9,980, of whom 8,608 were slaves. It has a low surface and a fertile soil. The productions in 1855 were 440,410 bushels of Indian corn, and 34,872 bales of cotton. Value of real estate, \$3,114,287. Capital, Richmond. IX. An E. co. of Texas, formed in 1853 from Grimes, Walker, and Leon cos., bounded E. by the Trinity river, and W. by the Navasoto; area, about 550 sq. m.; white pop. in 1857, about 1,800. The surface is rolling, covered with pine and oak; the soil good in the bottoms, sandy elsewhere. Capital, Madisonville. X. A N. W. co. of Ark., bordering on Mo., drained by White river and its branches; area, 1,000 sq. m.; pop. in 1854, 5,577, of whom 206 were slaves. It has a diversified surface and fertile soil. The productions in 1854 were 353,-

418 bushels of Indian corn, 28,574 of wheat, and 34,808 of oats. Capital, Huntsville. XI. A W. co. of Tenn., watered by branches of the Forked Deer river; area, 625 sq. m.; pop. in 1850, 21,470, of whom 8,552 were slaves. The surface is undulating and the soil fertile. The productions in 1850 were 1,045,424 bushels of Indian corn, 67,245 of sweet potatoes, and 34,840 lbs. of tobacco. There were 35 grist mills, 18 saw mills, 9 tanneries, 39 churches, and 1,382 pupils attending schools. The Mobile and Ohio railroad intersects the county, and the Mississippi central and Tennessee railroad has its terminus at the capital, Jackson. XII. A central co. of Ky., bounded N. by the Kentucky river; area, 434 sq. m.; pop. in 1850, 15,727, of whom 5,898 were slaves. It has an undulating surface and fertile soil. The productions in 1850 were 1,424,856 bushels of Indian corn, 176,400 of oats, 60,511 lbs. of tobacco, and 55,409 of wool. There were 23 grist mills, 11 saw mills, 2 tanneries, 20 churches, and 1,957 pupils attending schools. Capital, Richmond. XIII. A S. W. co. of Ohio, drained by Darby and Deer creeks; area, 400 sq. m.; pop. in 1850, 10,015. It has a nearly level surface and fertile soil. The productions in 1850 were 726,451 bushels of Indian corn, 23,540 of wheat, 51,627 of oats, and 120,696 lbs. of wool. There were 9 grist mills, 3 saw mills, 5 tanneries, 24 churches, and 3,883 pupils attending schools. The Columbus and Xenia and Springfield and Columbus railroads intersect the county, passing through the capital, London. XIV. A central co. of Ind., drained by White river and its branches; area, 430 sq. m.; pop. in 1850, 12,375. It has an undulating surface and very fertile soil. The productions in 1850 were 107,438 bushels of wheat, 895,817 of Indian corn, 47,857 of oats, and 37,775 lbs. of wool. There were 12 grist mills, 10 saw mills (4 steam), 8 tanneries, 20 churches, and 2,752 pupils attending schools. There are several mounds on the S. bank of White river. The Bellefontaine railroad line intersects the county, passing through the capital, Anderson. XV. A S. W. co. of Ill., bordered on the W. by the Mississippi river, and drained by Cahokia and Silver creeks; area, 760 sq. m.; pop. in 1855, 31,556. The surface is undulating and the soil very fertile. The productions in 1850 were 88,893 bushels of wheat, 1,153,183 of Indian corn, 202,159 of oats, and 19,878 lbs. of wool. There were 15 grist mills, 9 saw mills, 3 tanneries, 78 churches, and 3,783 pupils attending schools. The Terre Haute, Alton, and St. Louis railroad, and the St. Louis, Alton, and Chicago railroad pass through the county. Capital, Edwardsville. XVI. A S. E. co. of Mo., drained by St. Francis and Whitewater rivers; area, 640 sq. m.; pop. in 1850, 6,256, of whom 571 were slaves. The soil is moderately fertile. Very fine iron and lead ores abound. The productions in 1850 were 11,439 bushels of wheat, 266,690 of Indian corn, 39,505 of oats, and 10,102 lbs. of wool. There were 5 grist mills, 6 saw mills, and 4 churches. Capital, Fredericks-

town. XVII. A S. W. co. of Iowa, drained by North and Middle rivers, tributaries of the Des Moines, and by a branch of Middle river; area, 896 sq. m.; pop. in 1859, 7,071. It has an undulating surface and fertile soil. The productions in 1859 were 12,787 bushels of wheat, 244,817 of Indian corn, 13,365 of potatoes, 7,910 tons of hay, and 5,289 galls. of sorghum molasses. Capital, Winterset.

MADISON. I. A post village, capital of Morgan co., Ga., 41 m. N. from Milledgeville and 108 m. W. from Augusta; pop. in 1850, 2,516. It is on the line of the Georgia railroad, pleasantly situated in the midst of a fertile country from which it derives an active trade. It is the seat of the Madison female college (Methodist), the Baptist collegiate institute, the Madison male academy, and a high school for boys. II. A city and capital of Jefferson co., Ind., on the Ohio river, 100 m. W. S. W. from Cincinnati and 50 m. N. E. from Louisville; pop. in 1858, about 12,000. It is beautifully situated, at an elevation secure from floods, in a valley about 3 m. long, enclosed on the N. by a range of hills 400 feet in height. The streets are regularly laid out, and a large proportion of the houses are built of brick. It is lighted with gas and supplied with water by an aqueduct. It contains a fine court house, 2 large markets, 8 banks, 18 churches, and a number of schools. There are also many manufactures of cotton, wool, and iron, and 5 large flouring mills. It has several extensive pork packing establishments and a large trade in provisions. The exports for the year 1857 amounted to \$5,398,674, the imports to \$5,453,267. It is connected with Indianapolis by the Madison and Indianapolis railroad. It was first settled in 1808. III. A city of Wisconsin, capital of the state and of Dane co., situated in lat. 43° 4' N., long. 89° 28' W., about 80 m. W. from Lake Michigan and E. from the Mississippi river; pop. in 1850, 1,672; in 1855, 8,658; in 1860, about 10,000. It is built in the midst of the "Four Lake region," so called from a chain of beautiful lakes which extend over a distance of 16 m. and discharge their surplus waters into Yahara or Catfish river, a tributary of Rock river. Mendota or Fourth lake, the uppermost and largest, is 9 m. long, 6 m. wide, and from 50 to 70 feet deep in some places, and fed chiefly by springs; it has beautiful white gravelly shores and pure cold water. Monona or Third lake is 5½ m. long and 2 m. wide, and Lakes Waubesa and Kegonsa are each about 3 m. in length by 2 m. in width. The city of Madison occupies an undulating isthmus between Lakes Mendota and Monona, and in point of situation and scenery is the most beautiful city in the West. It is about 3 m. in length and 1 m. in breadth, and has wide, straight, and regular streets, with many beautiful buildings. The capitol, placed in the centre of a square park of 14 acres wooded with native timber, is built of limestone, and commands a fine view. It contains the state offices, library, legislative chambers, &c. A new capitol is now (1860)

erecting, which will cost \$400,000. The state university, situated here, has a fund of about \$350,000. It was founded in 1851, and in 1859 had 7 professors, 176 students, and a library of 1,900 volumes. A medical department was founded in 1856, but never went into operation. The university buildings occupy an eminence on Lake Mendota, surrounded by a park of 40 acres. Madison is also the seat of the state lunatic asylum, and contains a historical society, a commercial college, a public high school and ward schools, a number of private schools, gas works, 5 banks, and 8 churches (1 Baptist, 1 Congregational, 1 Episcopal, 1 German Evangelical, 1 Methodist, 1 Presbyterian, and 2 Roman Catholic). Three daily, 7 weekly, and 2 monthly periodicals are published here, 2 of the weekly journals being in the Norwegian language. The rich surrounding country combines with other advantages to render Madison an active commercial centre, and its sales of merchandise in 1856 amounted to \$4,702,000. The value of its manufactures and home products in the same year was \$1,265,000, consisting chiefly of stone, brick, flour, ale and beer, wagons and carriages, iron ware, clothing, and agricultural implements. It has easy communication with all parts of the country by means of the Milwaukee and Mississippi railroad; several other railroads are projected or in course of construction. Madison was chosen as the state capital in 1836, at which time it was a wilderness.

MADISON, JAMES, D.D., an American clergyman, bishop of the Protestant Episcopal church in Virginia, born in Rockingham co., Va., Aug. 27, 1749, died March 6, 1812. He was graduated at William and Mary college in 1772, chose the profession of law, and was admitted to the bar, but soon after abandoned it for the study of divinity. In 1773 he was chosen professor of mathematics in William and Mary college, and by permission of the board he went to England in 1775, and was admitted to orders by the bishop of London. In 1777 he was elected president of the college, and revisited England, where he remained till the close of 1778. During the revolution he succeeded in keeping the college in active operation. The degree of D.D. was conferred upon him in 1785 by the university of Pennsylvania. Dr. Griffith, who had been chosen as the first bishop of Virginia, having declined the post, Dr. Madison was selected for the episcopate, and was consecrated by the archbishop of Canterbury, in Lambeth palace, Sept. 19, 1790. He continued to discharge the duties of president of the college, and professor of natural and moral philosophy, international law, &c., together with those of the episcopate, until his death. His only publications were several occasional discourses, and a "Eulogy on Washington" (1800).

MADISON, JAMES, 4th president of the United States, born in King George, Va., March 16, 1751, died at his seat of Montpelier, near Orange Court House, Va., June 28, 1836. His father was James Madison of Orange, a

planter of ample means and high standing, descended from John Madison, an Englishman who settled in Virginia about the year 1653. The maiden name of his mother was Eleanor Conway. He was the eldest of 7 children, and was sent at an early age to a school in King and Queen co., under the direction of Donald Robertson, a Scotchman. He afterward prosecuted his studies at home, under the Rev. Thomas Martin, the minister of the parish, who resided at Montpelier, and acquired a competent knowledge of Latin, Greek, French, and Italian. In 1769, at the age of 18, he was sent to Princeton, N. J., where he was graduated A.B. in 1771. He continued at college, however, until the spring of 1772, pursuing a course of reading under Dr. Witherspoon, the president, for whom he had contracted a warm friendship. His habits of application were so close at this period, that his health became seriously affected. For months together, he allowed himself but 8 hours for sleep out of the 24, and when compelled to discontinue this pernicious system, limited his hours of rest to the least number consistent with the preservation of his strength. From the inroads which he made upon his constitution at this early period he seems never to have wholly recovered. In 1772 he returned to Virginia, and commenced a course of legal study, with which he mingled a large amount of miscellaneous reading and study in theology, philosophy, and belles-lettres. His attention was particularly directed to the first, and he thoroughly explored all the evidences of the Christian religion. From these pursuits he was soon diverted by public affairs. The colony was agitated by the impending struggle with England, and by internal questions of great moment. The subject of religious toleration began to assume a vital significance. The clergy of the Baptist and other nonconformist denominations had been subjected to violent persecution, and an effort was speedily made by the friends of religious rights to cure this abuse. Mr. Madison distinguished himself in his county by the zeal and activity which he displayed in defence of the Baptists particularly. In the spring of 1776 he was elected a member of the Virginia convention from the county of Orange, and procured the passage of the substance of an amendment to the declaration of rights by George Mason, which struck out the old term toleration and inserted a broader exposition of religious rights. He was in the same year a member of the general assembly, but lost his election in 1777, from his refusal to treat the voters, and the general want of confidence in his powers as a public speaker. Mr. Jefferson refers to his "extreme modesty" at this time, and he evidently distrusted his own abilities. In spite of his defeat, the legislature on its meeting in November of the same year elected him a member of the council of state; and in the winter of 1779 he was chosen by the assembly a delegate to congress. He took his seat in March, 1780, and remained in that body for 8 years.

His public services during this period were important. He strongly opposed the issue of paper money by the states, and was in favor of a formal recommendation on the part of congress against the continuance of the system. As chairman of the committee to prepare instructions to the U. S. ministers at Versailles and Madrid, in support of the claims of the confederacy to western territory and the free navigation of the Mississippi, he drew up an elaborate and able paper, which was unanimously adopted by congress. He zealously advocated in 1783 the measures proposed to establish a system of general revenue to pay the expenses of the war, and as chairman of the committee to which the subject was referred prepared an able address to the states in support of the plan, which was adopted by congress, and received the warm approval of Washington. A striking proof of the value which the people of Virginia attached to his services, is exhibited by the fact that the law rendering him ineligible after 8 years' service in congress was repealed, in order that he might sit during a 4th. On his return to Virginia he was elected a member of the legislature, and took his seat in 1784. In this body he advocated a large number of wise and liberal laws. He inaugurated the measures relating to a thorough revision of the old statutes, and gave his support to the bills introduced by the revisers, Jefferson, Wythe, and Pendleton, on the subject of entails, primogeniture, and religious freedom. He aided in the separation of Kentucky from Virginia and the formation of the new state, opposed the further issue of paper money, and took a prominent part in favor of the payment of debts due to British creditors. His greatest service at this time was the preparation, after the adjournment of the assembly, of a "Memorial and Remonstrance" against the project of a general assessment for the support of religion. This paper is one of the ablest and most eloquent ever drawn up by its author, and caused the complete defeat of the measure against which it was directed. It definitely settled every question of principle and policy embraced in the discussion, and placed the great system of separation of church and state upon an unassailable foundation. In Jan. 1786, Mr. Madison obtained the passage of a resolution by the general assembly of Virginia, inviting the other states to appoint commissioners to meet at Annapolis, and devise a new system of commercial regulations, of greater efficiency than that under the articles of confederation. Mr. Madison was chosen one of the commissioners, and attended at Annapolis in September of the same year. Five states only were represented, and the commissioners recommended a convention of delegates from all the states to be held at Philadelphia in May, 1787. The recommendation was generally adopted, and Mr. Madison was chosen one of the delegates from Virginia. The convention assembled, and the result was the abrogation of the old articles, and the formation of the constitution of the United States.

Mr. Madison was prominent in advocating the constitution, and took a leading part in the debates, of which he kept private notes, since published by order of congress. His views in regard to the federal government are set forth at length in a paper still extant in the handwriting of Gen. Washington. This paper contains the substance of a letter written to Washington by Mr. Madison before the meeting of the convention, and proposes a scheme of thorough centralization. The writer declares that he is equally opposed to "the individual independence of the states" and to "the consolidation of the whole into one simple republic." He is nevertheless in favor of investing congress with power to exercise "a negative in all cases whatever on the legislative acts of the states, as heretofore exercised by the kingly prerogative." He says further that "the right of coercion should be expressly declared; . . . but the difficulty and awkwardness of operating by force on the collective will of a state, render it particularly desirable that the necessity of it should be precluded." From these extreme views Mr. Madison afterward conscientiously departed, but in the convention he supported them with zeal and vigor. The scheme known as the "Virginia plan" was adopted instead, and the convention adjourned. The question of ratifying or rejecting the constitution remained for the decision of the states separately; and during the interval which elapsed between the adjournment of the body and the assembling of the state conventions, a warm discussion took place throughout the country upon the merits of the scheme of government, and the propriety of its adoption. Many of the ablest statesmen of the country expressed great distrust of the instrument, and opposed its ratification by every means in their power. Vehement debates took place, in public meetings and the newspapers; and the result seemed exceedingly doubtful. The subsequent adoption of the constitution was in large measure brought about by a series of essays now familiar, in their collected form, as "The Federalist." They were commenced in a New York newspaper soon after the adjournment of the convention, and continued to appear until June, 1788. The public journals everywhere republished them, and they were soon known to be the work of Mr. Hamilton, Mr. Madison, and Mr. Jay. The effect of these essays upon public opinion was very great. They changed or materially modified the views of many thousands of persons, among whom were some of the profoundest thinkers of the epoch. Jefferson wrote of the work: "In general it establishes firmly the plan of government. I confess it has rectified me on several points." The volume remains the most forcible exposition upon the side which it espoused. The whole ground is surveyed generally and in detail; the various points at issue are discussed with the utmost acuteness, and the advantages of the adoption of the instrument urged with a logical force and elo-

quence which place the "Federalist" beside the most famous political writings of the old English worthies. The Virginia convention assembled in June, and Mr. Madison was a member of the body. He soon established his claim to a prominent position among the leading men. He had succeeded in completely overcoming his natural diffidence, and, although deficient as an orator, was enabled by his profound acquaintance with every topic involved in the discussion to exert a powerful influence over his associates. On both sides were ranged men of eminent abilities. The leaders of the constitution party were Marshall, Pendleton, Wythe, Edmund Randolph, and other statesmen of high reputation. Opposed to these were Monroe, Grayson, Henry, and Mason. The two last named were a host in themselves—the one for his passionate and splendid eloquence, the other for a massive vigor of reasoning which made him almost irresistible in any discussion in which he earnestly engaged. The high position which Mr. Madison immediately assumed, and fully maintained, in a body composed of such men, is the best commentary upon the character of his intellect. He was unquestionably a great power in the convention, and contributed to the final triumph of the constitution as much as any one in the body. The instrument was adopted by a vote of 89 to 79, and the convention rose. The part which he had taken in its deliberations very greatly increased Mr. Madison's reputation as a statesman; and he was brought forward as a candidate for the U. S. senate. The attempt to elect him, however, failed. This resulted from the peculiar state of parties. Although the federalists had achieved a victory in the convention, and procured a fair majority in favor of the adoption of the constitution, they were outnumbered by their opponents in the commonwealth at large, and by the anti-federal representation in the legislature. Mr. Madison therefore suffered a defeat, and Lee and Grayson were elected in place of the candidates of the federalists. He was however chosen a representative in congress, and took his seat in that body in April, 1789. Here he found himself compelled to adopt a thoroughly independent course of action, or violate the most deeply rooted convictions of his understanding. Alexander Hamilton was at the head of the treasury department, and Mr. Madison was obliged either to support the great series of financial measures initiated by the secretary, or distinctly abandon his former associate, and range himself on the side of the republican opposition. He unhesitatingly adopted the latter course. Although he had warmly espoused the adoption of the constitution, he was now strongly convinced of the necessity of a strict construction of the powers which it conferred upon the general government. He accordingly opposed the funding bill, the national bank, and Hamilton's system of finance generally. Many proofs remain of the fact that Mr. Madison assumed this attitude of opposition to

the administration with great reluctance, and only under the pressure of his conscientious convictions of public duty. His affection for Washington and long friendship for Hamilton rendered such a step peculiarly disagreeable to a man of his amiable and kindly disposition. The tone of his opposition, however, did not alienate his former friends. It was moderate and dispassionate. Occupying middle ground between the violent partisans on both sides, he preserved himself from extreme views in either direction, and labored to reconcile and harmonize the antagonism of both parties. He thus secured the confidence and respect even of those with whom he differed. He always retained the cordial regard of Gen. Washington. On Mr. Jefferson's return from France, Mr. Madison was solicited to accept the mission, and it was kept open awaiting his decision for 12 months. He declined the place, as he afterward did the office of secretary of state on the retirement of Jefferson, from a conviction that the radical antagonism of views between himself and the majority in the cabinet would render his acceptance of either office fruitful in misunderstandings and collisions. Hamilton was the ruling power in the cabinet, and Mr. Madison, with his customary discretion, declined an honor which promised a result so unsatisfactory to himself and the party to which he had signified his adhesion. He remained in congress, and became thoroughly identified with the republicans. In 1792 he was the avowed leader of the party in congress. In 1794 he gave his full support to its foreign policy by moving a series of resolutions, based upon the report of Mr. Jefferson advocating a retaliatory policy toward Great Britain, and commercial discriminations in favor of France. These resolutions he supported by a speech of great ability. In 1795 it was the wish of many of his friends that he should become the candidate of the republican party to succeed Gen. Washington. Mr. Jefferson wrote: "There is not another person in the United States who being placed at the helm of our affairs, my mind would be so completely at rest for the fortune of our political bark." Mr. Madison however discouraged the idea. "Reasons of every kind" forbade it, he replied; and the subject was not resumed. In March, 1797, Mr. Madison's term expired, and he returned to Virginia. The period at which he vacated his seat in congress was a critical one. Events soon occurred which threatened to plunge the country into war. The insulting treatment of the American envoys to France, and the war message of President Adams, were about to be followed by the passage of the alien and sedition laws. The republicans vainly tried to stem the popular current in favor of the measures of the administration. The agitation was so intense, that the opponents of the federal party were overwhelmed. Their protests were completely drowned in the popular outburst against France, and on the floor of congress they were in a helpless minority. The

passing of the alien and sedition laws in July, 1798, gave them the first opportunity to make a stand. Opposition to even these violent measures was however ineffectual in the federal legislature; and the republican leaders determined to resort to the state arenas for the decisive struggle. It commenced in Kentucky, and resulted there in the adoption of a series of resolutions, which were followed, in Dec. 1798, by similar resolves of the Virginia assembly. The latter, now known as "the resolutions of 1798-'99," were offered by John Taylor of Caroline, but drawn up by James Madison, not then a member. They remain, together with the subsequent "Report" by the same writer, the great text book of the party in favor of a strict construction of the powers of the federal government. They declared the determination of the assembly to defend the constitutions of the United States and of the states, but to resist all attempts to enlarge the authority of the federal compact by forced constructions of general clauses, as tending to consolidation, the destruction of the liberties of the states, and finally to a monarchy. In case of a "deliberate, palpable, and dangerous" exercise of powers not clearly granted to the general government, the states had a right to interpose; and as the passing of the alien and sedition laws was such an infraction of right, the assembly protested against those laws as unconstitutional and dangerous to the liberties of the commonwealth. The 7th resolution called upon the people of other states to join with the state of Virginia "in declaring, as it does hereby declare, that the acts aforesaid are unconstitutional, and that the necessary and proper measures will be taken by each for coöperating with this state in maintaining unimpaired the authorities, rights, and liberties reserved to the states respectively, or to the people." The resolutions passed the house by a vote of 100 to 68, and were duly communicated to the several states of the Union. They met with little favor, especially in the northern states. Massachusetts and New England generally remonstrated against them, and declared the obnoxious laws both constitutional and expedient. This drew forth, in the winter of 1799-1800, Mr. Madison's "Report" in defence of his resolutions. This elaborate paper subjected the resolves to an exhaustive analysis, and defended them with masterly vigor. It is the most famous of all Mr. Madison's political writings, and will rank with the greatest state papers written in America. Although the resolutions met with an unfavorable response from the other states, they exerted a powerful influence upon public opinion. Virginia had shown how deeply in earnest she was by directing the establishment of two arsenals, and an armory sufficiently large to store 10,000 muskets and other arms; but a wholesome change in the sentiment of the country happily restored good feeling, and softened down all bitterness. The alien and sedition laws found few supporters ultimately, and Mr. Madison's views

were fully vindicated. The revulsion against the federal party and in favor of the republicans terminated in the election of Mr. Jefferson, who entered upon the presidency in 1801. Mr. Madison was offered the place of secretary of state, which he accepted, and continued to fill during the 8 years of Mr. Jefferson's administration. During this period of service his opinions upon public affairs, and his official action, closely agreed with the views of the president. He became still more popular with and acceptable to his party, and toward the end of Mr. Jefferson's second term was generally spoken of for the presidency. A caucus was finally held of the majority of the republican members of congress, and Mr. Madison was nominated. This proceeding, however, met with bitter opposition from a wing of the party, headed by John Randolph, who were friendly to the election of Mr. Monroe and inimical to Mr. Madison. These gentlemen published a caustic "Protest" against the action of the caucus, and denounced Mr. Madison for his "want of energy," his connection with the "Federalist," and his report upon the Yazoo claims. His friends defended him against all the charges, and retorted so strongly upon the authors of the protest that they were silenced. The action of the caucus was approved by the party generally, and Mr. Madison was elected by a vote of 122 out of 175, and took his seat as president, March 4, 1809. —He entered upon the presidency at a crisis in public affairs which required the utmost foresight, resolution, and prudence. Great Britain and the United States were on the verge of war. In 1807 the long series of wrongs inflicted by England upon the commerce of America, and the rights of her seamen, had been consummated by the affair of the Leopard and Chesapeake. This wanton insult had thrown the country into violent commotion, and occasioned the embargo, which had been succeeded by the non-intercourse act, prohibiting all commerce with France or England until the decrees of the French emperor and the British orders in council in relation to the seizure of neutrals and the impressment of seamen were repealed. Mr. Jefferson had retired from the presidency at this threatening crisis, and the new administration was immediately called upon to provide for the emergency. The first act of the British cabinet did not encourage hopes of peace. This was a disavowal of the course of Mr. Erskine, the English minister, in promising reparation for the affair of the Chesapeake and a repeal of the obnoxious orders in council, on condition of a renewal of intercourse on the part of the United States. Mr. Erskine was declared to have exceeded his authority, and was recalled. He was succeeded by Mr. Jackson, who was authorized to enter into negotiations for a commercial treaty. This gentleman speedily became embroiled with the secretary of state. His tone was so discourteous and insulting that the president directed the secretary to receive no further communications from him, and soon after-

ward requested his recall. This was complied with, but no censure was visited upon the envoy, and none other was sent in his place. In May, 1810, congress approved the course of the executive, declared the official communications of Mr. Jackson highly indecorous and insolent, and passed a new act of non-intercourse. This provided that if either France or England repealed her hostile decrees, and the other did not within 8 months do likewise, then intercourse should be renewed with the one, while with the other non-intercourse should be persisted in. In August the French minister for foreign affairs gave notice to the American minister that the Berlin and Milan decrees had been revoked by the emperor; and in November Mr. Madison issued his proclamation, declaring the fact, and announcing that the act of non-intercourse would be revived as to Great Britain unless her orders in council should be revoked within 8 months from the date of the proclamation. The British government resisted this demand on the ground that there was no official evidence of the repeal of the French decrees, and the act of non-intercourse was accordingly declared in full force against Great Britain. In March, 1811, the emperor Napoleon disavowed the statement of the duke of Cadore, and declared that "the decrees of Berlin and Milan were the fundamental laws of the empire." American vessels had been seized and sequestered by France even after the president's proclamation, and every overture on the part of the American minister at Paris toward the re-establishment of friendly relations between the two countries was viewed with indifference, and completely failed in its object. Such was the condition of public affairs in the beginning of the year 1812. The country was slowly but surely drifting toward a war, which no exertions on the part of the administration seemed adequate to prevent. Mr. Madison was averse from native temperament of mind to such an event, and pushed his pacific views to an extent which proved displeasing to many of the most prominent members of the republican party. The non-intercourse laws and other restrictive measures had become exceedingly unpopular with a large portion of the country, and a majority of the people were now believed to be in favor of a declaration of war against England. Mr. Clay, Mr. Calhoun, and Mr. Lowndes accordingly advised measures of preparation, and congress promptly responded. Bills were passed for augmenting the army, repairing and equipping ships of war, organizing and arming the militia, and placing the country in an attitude to resist an enemy. To carry these acts into effect, congress appropriated the sum of \$1,000,000. Mr. Madison acquiesced in this policy with extreme reluctance. He still hoped that war might be avoided. But it was obvious that the great body of the republican party were bent upon the measure, and the president abandoned his opposition, and gave his assent. In Feb. 1812, Mr. Russell, U. S. *chargé d'affaires*

at London, wrote to the secretary of state: "I no longer entertain a hope that we can honorably avoid war;" and in May, Mr. Foster, the British minister, addressed a communication to the same official, in which he distinctly reiterated the intention of his government not to depart from the position which she occupied. This communication terminated all hopes of avoiding hostilities, and on June 1 the president transmitted a special message to congress in which he reviewed the whole controversy, and spoke in strong terms of the aggressions of Great Britain upon commercial rights. The message was referred to the committee on foreign affairs, which on June 8 reported a manifesto, as the basis of a declaration of war. The discussion on the report of the committee took place with closed doors. The measure was speedily adopted in the house by a vote of 79 to 49, but the result in the senate was long doubtful. After 14 days' delay, however, that body yielded its opposition and declared in favor of war by a vote of 19 to 13. The act declaring war between Great Britain and the United States speedily followed. The president gave it his approval on June 18, and promptly issued his proclamation calling upon the people to prepare for the conflict, and to support the government. A short delay would probably have defeated the policy of the war party, and reopened the old negotiations. A decree of the French emperor had been exhibited to the U. S. minister to France, dated April 28, 1811, which declared the definite revocation of the Berlin and Milan decrees, from and after Nov. 1, 1810. In consequence of this, Great Britain, on June 28, within 5 days after the declaration of war, repealed the obnoxious orders in council in relation to the rights of neutrals, and thus removed one of the great grounds of complaint on the part of the American government. On June 26, before the course of the British cabinet was known in America, Mr. Monroe, secretary of state, wrote to Mr. Russell, who had remained in England since the recall of Mr. Pinkney in 1811, proposing the terms of an armistice. These were a repeal of the orders in council, with no illegal blockades substituted, and a discontinuance of the impressment of seamen. In the latter part of August Mr. Russell received from the English government a definite refusal to accede to these propositions as "on various grounds absolutely inadmissible," and thereupon returned to the United States. In September Admiral Warren arrived at Halifax. In addition to his naval command, he was invested with powers to negotiate a provisional accommodation with the U. S. government. A correspondence on the subject ensued between himself and Mr. Monroe, as the representatives of the two countries. The admiral proposed an immediate cessation of hostilities, with a view to the peaceful arrangement of the points at issue. Mr. Monroe replied that his government was willing to accede to this proposition, provided Admiral Warren was authorized and would agree to negotiate terms for

suspending in future the impressment of American seamen. All negotiations upon this point failed. The British government refused to relinquish the claim, and nothing remained but war.—On March 4, 1818, Mr. Madison entered upon his second term of service. He received 128 electoral votes; his opponent, De Witt Clinton, 89 votes. The congressional elections resulted in a large majority in favor of the administration, and the war policy thus appeared to be acceptable to the great body of the people, though a strong party were bitterly opposed to it, and endeavored to obstruct the measures necessary for the prosecution of hostilities. The contest commenced in earnest with the appearance, in Feb. 1818, of a British fleet in the Chesapeake bay; and in March the whole coast of the United States, with the exception of Rhode Island, Massachusetts, and New Hampshire, was declared in a state of blockade. The long series of engagements on land and water, during the war which followed—the melancholy defeats and glorious victories which alternately marked the contest—find their proper place in the general history of the country. In March, 1813, soon after the commencement of hostilities, the Russian minister to the United States communicated to the American government a proposal from the emperor Alexander to mediate between the belligerents. The proposition was accepted, and the president appointed commissioners to proceed to St. Petersburg, to negotiate under the mediation of the emperor. The effort failed. Great Britain declined the Russian mediation in September; but in November the American government was informed that Great Britain was prepared to negotiate the terms of a treaty of peace. Steps were at once taken to meet this proposal of the English government. Mr. Olney and Mr. Russell were added to the commission previously appointed, and in Jan. 1814, proceeded to Europe and joined their associates. In August of the same year the indignation of the country was deeply aroused by the attack upon the capital. A British force of 5,000 men ascended the Chesapeake, landed on the shores of the Patuxent, and marched upon Washington. The few troops hastily called together were wholly unable to offer any effective resistance, and retired before the enemy, who proceeded to the city, burned the capitol, the president's house, and other public buildings, and returned without loss to their ships. The president and several members of his cabinet were in the American camp, but were compelled to abandon the city in order to avoid capture. The enemy gained little by their movement, and the wanton outrage, so opposed to every rule of civilized warfare, only increased the bitterness of the people. Among the public occurrences of the year 1814, the meeting of the Hartford convention occupies a prominent place. (See *HARTFORD CONVENTION*.) The glorious victory at New Orleans, however, and the intelligence of the conclusion of peace, terminated the popular agitation. A treaty of

peace had been signed by the U. S. commissioners at Ghent, on Dec. 24, 1814, and being communicated by the president to the senate, was ratified by that body in Feb. 1815. It was silent upon the paramount question of the right of impressment, and left the commercial regulations between the two countries for subsequent negotiation. But the country was tired of the war, and the treaty was hailed with acclamation. In this general joy no one shared more sincerely than Mr. Madison. He had acquiesced in the commencement of hostilities with unfeigned reluctance, and had longed for the conclusion of peace. Wanting by nature in these fierce elements of character which mark the military chieftain, he had contemplated only the immense loss of life, the national embarrassment, and the prostration of all the resources of the country which would accompany the contest. There can, however, be little doubt that the war of 1812 was of the greatest benefit to the country in its final results. It proved that the spirit of the revolution lived in the breasts of the people; that American seamen were a full match for the boasted mariners of England; and that in spite of the existence of a powerful party wholly disaffected to the course of the government, the principle of nationality and obedience to law was stronger in the country than all else which could come in conflict with it. Other results were the promotion of domestic manufactures and internal improvements, and the reorganization of the army and navy, which had hitherto been viewed with unwise jealousy and suffered to languish. The country thus came out of a war which cost her 80,000 lives and \$100,000,000, stronger and more honored than before, thoroughly convinced of her own power and resources, and regarded with increased respect by all the nations of the world. In 1815 a commercial treaty was concluded with Great Britain, based upon a policy of perfect reciprocity between the two countries. The subjects of impressment and blockades were not embraced in it. The return of peace disbanded the organized opposition to the administration, and the remainder of Mr. Madison's term of office was undisturbed by events of an exciting character. In April, 1816, congress incorporated a national bank with a capital of \$35,000,000, to continue for 20 years. The president had vetoed a similar bill in January of the preceding year, but now approved of it, from a conviction that the derangement of the currency made such a measure necessary. It encountered strong opposition, but was supported by Mr. Clay and other friends of the administration, and passed successfully both houses. In Dec. 1816, Mr. Madison sent in his last annual message to congress. Its recommendations were considered liberal and judicious, and secured the general approbation of the country.—On March 8, 1817, his long official connection with the affairs of the nation terminated, and he retired to his farm of Montpelier in Virginia. In this pleasant retreat

he passed his days tranquilly in agricultural pursuits and the enjoyment of the society of his friends. He had married in 1794 Mrs. Todd, a Virginia lady, the widow of a distinguished lawyer of Philadelphia; and though their union had not been blessed with children, this amiable and accomplished woman's faithful devotion was a source of the greatest happiness to him. During these years, in spite of his infirm health, Mr. Madison still busied himself in useful services to his neighbors and the commonwealth. He was chosen president of the county agricultural society, and for a long time acted as visitor and rector of the university of Virginia. In 1829 he sat in the Virginia convention to reform the old constitution; and many hundreds of the new generation scanned with eager curiosity the venerable countenance of the octogenarian, whose public career had commenced far back in the days of 1776. The deep interest of the spectators extended to the members of the convention, which embraced the most famous men of the epoch in Virginia. When he rose, after long silence, to utter a few words, the members left their seats and crowded around the venerable figure, dressed in black, with his thin gray hair still powdered as in former times, to catch the low whisper of his voice. This was his last appearance in public. Returning to Montpelier, he passed the rest of his days in tranquil retirement.—The mental and moral characteristics of James Madison are patent on the face of his career. If not endowed with the very first order of ability in comparison with the great men of his times, his mind was yet singularly symmetrical in its proportions, and vigorous in its movements. His range was not equal to that of some others, but an unflinching accuracy and precision marked the operation of his faculties. He was naturally deficient in powers of oratory, and yet made himself one of the most effective public speakers of his time, although the epoch was illustrated in Virginia by such men as Patrick Henry, Richard Henry Lee, George Mason, and Edmund Pendleton. Mr. Jefferson's testimony upon this point is very strong. "Mr. Madison," he says, "came into the house in 1776, a new member and young; which circumstances, concurring with his extreme modesty, prevented his venturing himself in debate, before his removal to the council of state in Nov. 1777. From thence he went to congress, then consisting of few members. Trained in these successive schools, he acquired a habit of self-possession, which placed at ready command the rich resources of his luminous and discriminating mind and of his extensive information, and rendered him the first of every assembly afterward of which he became a member. Never wandering from his subject into vain declamation, but pursuing it closely, in language pure, classical, and copious, soothing always the feelings of his adversaries by civilities and softness of expression, he rose to the eminent station which he held in the great national convention of

1787; and in that of Virginia which followed, he sustained the new constitution in all its parts, bearing off the palm against the logic of George Mason and the fervid declamation of Mr. Henry. With these consummate powers were united a pure and spotless virtue, which no calumny has ever attempted to sully. Of the powers and polish of his pen, and of the wisdom of his administration in the highest office of the nation, I need say nothing. They have spoken and will for ever speak for themselves." The warm friendship felt by the writer of the above for Mr. Madison doubtless colored the expressions; but the estimate is in substance wholly just. From his earliest years Mr. Madison was a hard student. His memory was singularly tenacious, and what his penetrating mind once clearly discerned became assimilated, and was ever after retained. He thus laid up that great store of learning which in the conventions of 1787, and 1788 especially, proved so effective in the enforcement of his views. Clearness of vision was one of the marked traits of his intellect, and laborious practice enabled him to convey his thoughts in the fullest manner. The result was that he exhausted the subject upon which he spoke. When he had finished, nothing remained to be said. His manner of speaking was calm and conciliatory. This was an accurate reflex of the character of his moral nature. Averse by temperament to all extreme and violent views, and disposed to occupy middle ground between contending factions, he never became embittered in the struggle, and treated those who were opposed to him with unaffected courtesy and respect. A marked instance of this may be found in the position which he occupied in congress during the administration of Gen. Washington. Forced to separate himself from Hamilton and the federal party, he indulged in no denunciations, but strove to harmonize the conflicting policies, and, though standing on middle ground, was assailed by neither party. It has been seen that upon more than one great measure he changed his views and his position. An impartial critic will not conclude from this that he was weak or vacillating or mercenary. A similar if not equally defined modification of views characterized some of the greatest minds of the age. The republic was an untried experiment, the political philosophy of the system had yet to be framed, and the leaders of the epoch were compelled to steer the bark without a compass or the lessons of experience. The proper subject of inquiry is the result; and tested by this, the political career of Mr. Madison will not need vindication. After Washington, no public man of his time was more widely respected and beloved by the people. It was his rare good fortune to have a whole nation for his friends. The public confidence in and respect for his well known honesty and singleness of aim toward the good of the country, ripened upon personal acquaintance with them into an affectionate attachment. His bearing and address

were characterized by simplicity and modesty. His dress was uniformly black, and he resembled a quiet student, busy with thoughts of his books, rather than the head of a great nation. He was somewhat taciturn in public, but when he conversed, his tone was weighty and impressive. It was often naked, abstract reasoning; mild, simple, and lucid, but summing up long trains of thought. With his intimate friends, however, the courteous reserve of the public man changed to the genial humor of a boy. He had a strong relish for every thing facetious, and told a story admirably. This sunshine of temperament never deserted him. In the weary hours of pain during his old age, his humor flashed up as spontaneously as before. When some friends came to visit him, he sank back upon his couch with the smiling words: "I always talk more easily when I *lie*;" and during his last illness, while the family and the doctor were at dinner, his voice was heard feebly from the adjoining chamber crying: "Doctor, are you pushing about the bottles? Do your duty, doctor, or I must cashier you." Of Mr. Jefferson he had a long list of stories, which turned the laugh against his friend invariably, to the great enjoyment of the victim himself. In addition to the passage already quoted, Jefferson wrote of Madison: "From three and thirty years' trial I can say conscientiously that I do not know in the world a man of purer integrity, more dispassionate, disinterested, and devoted to pure republicanism; nor could I in the whole scope of America and Europe point out an abler head." Mrs. Madison long survived her husband, and maintained a conspicuous and respected position in society at Washington till her death, July 12, 1849, at the age of 82 years.—See "Life and Times of James Madison," by William O. Rives (vol. i., 8vo., Boston, 1859).

MADISON UNIVERSITY. See HAMILTON, N. Y.

MÄDLER, JOHANN HEINRICH, a German astronomer, born in Berlin, May 29, 1794. In the earlier part of his life he gained a high reputation as a teacher in the principal normal schools of Berlin. Associating himself in 1829 with the astronomical labors of Wilhelm Beer, he published in concert with him the great map of the moon (Berlin, 1834-'6), and the work explanatory of it entitled *Allgemeine vergleichende Selenographie* (2 vols., 1837). In 1838 he was employed on the island of Rügen in chronological observations for the Russian government; in 1836 he was appointed director of the Berlin observatory, and in 1840 of that of Dorpat, Russia, an office which he still holds. Of great influence upon the progress of cosmology were his investigations in regard to the stellar system. Rejecting the hypothesis of the existence of a central body, preponderating in mass, as the universal centre of gravity, he found it in the Pleiades, in the very centre of the group in or near the bright star η Tauri (Aleyone). This hypothesis has been contested by Encke, Peters, and other astronomers. In addition

to those on the moon, his observations have been devoted to the physical aspects of Mars and Jupiter, to double stars, the determined periods of variable stars, and the centre of gravity of the solar system. Beside his work entitled *Central-Sonne* (Dorpat, 1846), the result of his investigations is embodied in his *Untersuchungen über die Fixsternsysteme* (Mittau, 1847-'8), and in various other publications. Among his most excellent works is his *Populäre Astronomie* (Berlin, 1841; 4th ed. 1849).

MADOC, a Welsh prince for whom the Cambrian chroniclers claim the honor of having discovered America. According to these authorities, Madoc, compelled by civil disturbances to leave his native country, sailed westward in 1170 with a small fleet, and after a voyage of some weeks landed on a continent of exuberant fertility, whose inhabitants differed altogether from those of Europe. After some time he returned to Wales, but left behind him 20 of his crew. He fitted out another fleet of 10 sail, departed again with the intention of revisiting the newly discovered land, and was never more heard of. Humboldt says: "The deepest obscurity still shrouds every thing connected with the voyage of the Welsh chief Madoc, son of Owen Guineth, to a great western land in 1170, and the connection of this event with the Great Ireland of the Icelandic saga. In like manner the race of Celto-Americans, whom credulous travellers have professed to discover in many parts of the United States, have also disappeared since the establishment of an earnest and scientific ethnology, based not on accidental similarities of sound, but on grammatical forms and organic structure." Madoc is the subject of one of Southey's principal poems.

MADONNA (It.), a word originally equivalent in Italy to the French *madame*, and as such used as a title of deference and honor; but now applied almost exclusively to the Virgin Mary, as she is called in other languages Our Lady. The title has also given the name to a great number of pictures in which the Virgin forms the sole or prominent object, such as the *Madonna di San Sisto* or the *Madonna della Seggiola* of Raphael. The "Legends of the Madonna" (8vo., London, 1852), by Mrs. Jameson, describes the manner in which the subject has been illustrated by different painters.

MADOZ, PASQUALE, a Spanish author and statesman, born at Pampeluna, May 17, 1806. His studies at Saragossa were interrupted in 1823 by his part in the defence of the castle of Monzon against the French invading army, and by his imprisonment during 17 months, after which he returned to the university, where he was graduated as doctor of laws; but, expelled on a charge of teaching Jansenist doctrines, he lived for some time at Tours in France. On his return to Spain he became editor of the "Universal Geographical Dictionary," commenced by Bergnes (10 vols. 8vo., Barcelona, 1829-'34), and published a "Collection of Celebrated Trials." In 1835 he was appointed judge at

Barcelona, and military governor of the valley of Aran. His spirited operations against the Carlist invaders of Catalonia secured for him the votes of the province of Lerida for the cortes. In 1842-'3 he took a prominent part in the movement against Espartero, on the success of which he was offered a seat in the cabinet and a supreme judgeship, both which he declined. He was afterward, in consequence of political troubles, imprisoned for a short time. In Aug. 1854, he was appointed governor of Barcelona, and having restored tranquillity in that city he resumed his seat in the cortes, where he was the acknowledged leader of the *progresista* party. He was also chosen president of that body. In Jan. 1855, he was appointed minister of finance, and proposed the famous law of *desamortisation*, decreasing the sale of the property vested in the state, the clergy, and other public bodies, which met with great opposition, particularly on the part of the clergy. He retired from the ministry in June, 1855, and was at the head of the opposition in the cortes until July, 1856, when he was compelled to flee on account of his resistance to the cabinet of O'Donnell. Beside the works named, he edited a *Diccionario geografico, estatistico y historico de España* (16 vols. 4to., Madrid, 1848-'50). Of this work he was the publisher as well as editor, having established a printing office at his own expense, and at the same time superintended the sale. He also directed for a time the *Catalan*, an opposition journal.

MADRAS, a presidency of British India, comprising the S. part of the peninsula of Hindostan, bounded N. by the presidencies of Bengal and Bombay, E. by the bay of Bengal, and S. and W. by the Indian ocean. It lies between lat. 8° and 20° N., and long. 74° 30' and 85° 30' E., and is divided into the following 22 districts:

| Districts. | Area in sq. m. | Population. |
|---|----------------|-------------|
| Rajahmundry | 4,501 | 1,012,086 |
| Masulipatam | 4,711 | 520,860 |
| Guntur (including Palnad) | 4,762 | 570,089 |
| Vizagapatam | 4,690 | 1,254,373 |
| Ganjam | 5,723 | 923,930 |
| Nellore | 7,859 | 965,090 |
| Chingleput | 2,717 | 563,463 |
| Madras | 27 | 720,000 |
| Arcot, N. division (including Consooddy) | 6,590 | 1,465,373 |
| Arcot, S. division (including Cuddalore) | 5,020 | 1,006,005 |
| Bellary | 12,101 | 1,229,599 |
| Cuddapah (including Poonganoo) | 13,293 | 1,451,921 |
| Salem (including Vemundoor and Mulapandy) | 7,499 | 1,195,377 |
| Coimbatore | 8,151 | 1,153,802 |
| Trichinopoly | 2,923 | 709,196 |
| Tanjore (including Nagore) | 3,781 | 1,676,036 |
| Madura (including Shevavanga and Ramnad) | 13,545 | 1,756,791 |
| Tinnevely | 5,483 | 1,900,216 |
| Malabar | 6,050 | 1,514,909 |
| Canara | 7,152 | 1,056,398 |
| Kurnool | 3,373 | 973,190 |
| Coorg | 2,165 | 60,000 |
| Total | 182,109 | 22,361,697 |

Within the boundaries of the presidency are also the following states and settlements not subject to Great Britain:

| Presidencies. | Area in sq. m. | Population. |
|-------------------------------------|----------------|-------------|
| FRENCH SETTLEMENTS. | | |
| Karikal | 68 | 49,307 |
| Pondicherry | 107 | 119,755 |
| Yanaon | 18 | 6,881 |
| Mahé | 9 | 2,616 |
| | 185 | 178,559 |
| NATIVE STATES. | | |
| Cochin | 1,998 | 298,174 |
| Mysore | 80,696 | 2,460,696 |
| Pondicherry | 1,165 | 61,745 |
| Travancore | 4,739 | 1,011,894 |
| Jeypoor and hill semindarries | 18,041 | 891,320 |
| | 51,509 | 5,213,671 |
| Total | 51,967 | 5,392,230 |

The total area of the Madras presidency is thus 184,096 sq. m., and its population 27,753,927. The principal cities and towns are Madras, the capital, Ganjam, Bellary, Bangalore, Calicut, Cannanore, Mysore, Mangalore, Seringapatam, Vellore, Pondicherry, Tanjore, Trichinopoly, and Cochin.—The coast line comprises 540 m. on the Indian ocean and Arabian sea, and 1,187 on the bay of Bengal, but it is almost destitute of good harbors. The estuaries of many of the rivers, however, afford anchorage for small vessels. The N. part of the W. coast is bold and rocky for a distance of about 150 m. What is known as the Malabar coast, stretching S. from Mt. Dilly to Cape Comorin, is generally low and sandy or muddy, and in some parts thickly wooded. To the E. of Cape Comorin, between the mainland and Ceylon, is the shallow and difficult gulf of Manar, whose shores are low, rocky, and beset with reefs. The Coromandel and Golconda coasts, which lie to the N., present no bold features, and have but 2 or 3 ports, vessels being obliged to anchor in the open sea at some distance from land. The N. E. part of the presidency is occupied by the coast of Orissa, with high rocky headlands and rugged hills. The principal rivers of Madras are the Godavery, Kistnah, Pennar, Palair, Punnaïr, and Cavery, all of which fall into the bay of Bengal. Those on the W. coast are very numerous, but small. Near their mouths they expand into broad shallow estuaries, or wide lagoons, called backwaters, one of which at Cochin reaches N. and S. a distance of 120 m.—The surface of the interior is diversified, the eastern and western Ghats running nearly parallel with the seaboard, while the S. part of the presidency is traversed by the ridges which connect these two great ranges at their S. extremities. The central and northern parts belong to the great table-land of the Deccan. The soil along the coasts is light and sandy, and inland it is impregnated with salt, which in dry weather appears upon the surface in the form of efflorescence. The climate is generally considered the hottest in India, but it varies greatly with differences of elevation. The table-land, being 6,000 or 7,000 feet above the sea, enjoys a cool and delightful temperature, and even in some parts of the low country the heat is mod-

erated by the regular alternation of the N. E. and S. W. monsoons. The fall of rain in the western Ghats is enormous, the rainy season in certain localities lasting 9 months.—The most important vegetable product of Madras is ship timber, of excellent quality and abundant. More than 100 kinds of trees, including the teak, peon, sandal wood, and cocoa palm, are found in the forests. Rice, maize, millet, ragi (*Eleusine coracana*), oil seeds, pulse, yams, plantains, sugar, tobacco, pepper, and cardamoms are extensively cultivated. The efforts of the British government to introduce the culture of cotton have been attended with success, but the state of agriculture in general is much in need of improvement. The most valuable minerals are iron (in the mining of which a company is largely engaged in Malabar and S. Arcot), copper, manganese, antimony, silver, emery, and lead. Both anthracite and bituminous coal are found on the banks of the Godavery, and gems are collected in various districts.—In a commercial point of view, Madras is the least important of the 3 presidencies. Up to the present time it has had few good avenues of land communication to compensate for its want of harbors; but the Madras railway company has several lines in progress, which will connect the city of Madras with Bombay, Calicut, Bepoor, Bangalore, &c. Portions of these routes have been open since 1856. The foreign trade is chiefly with Ceylon, Great Britain, the Arabian and Persian gulfs, Mauritius and Bourbon islands, New South Wales, France, Penang, Singapore, and Malacca. The imports, arranged according to values, are cotton manufactures, military stores, iron, wearing apparel, wines, fruits, horses, malt liquors, books and stationery, and manufactured metals; and the exports, grain, indigo, cotton goods, raw cotton, sugar, oil seeds, skins and hides, coffee, and spices. The following table shows the movements of shipping in 1855:

| Shipping. | Entered. | | Cleared. | |
|--------------------|----------|----------|----------|----------|
| | Vessels. | Tonnage. | Vessels. | Tonnage. |
| Foreign | 1,623 | 358,023 | 1,799 | 574,476 |
| Native | 2,908 | 177,606 | 4,408 | 211,497 |
| Total | 5,496 | 510,638 | 6,207 | 585,978 |

The imports and exports for the 3 years 1855-'7 were as follows:

| Years. | Imports. | Exports. |
|------------|------------|------------|
| 1855 | £1,351,556 | £2,068,669 |
| 1856 | 2,201,873 | 2,035,230 |
| 1857 | 2,540,730 | 2,407,906 |

The revenue of the presidency during the year ending April 30, 1858, was £4,580,978, and the expenditures were £5,388,458.—MADRAS, the capital of the above presidency, is situated on the bay of Bengal (Coromandel coast), in lat. 13° 5' N., long. 80° 21' E., 640 m. S. E. from Bombay, and 885 m. S. W. from Calcutta; pop. estimated officially at 720,000, the great majority of whom are Hindoos. There are very few Christians, and most of them are descendants

of Portuguese or of the converts made by Portuguese missionaries. The city extends about 9 m. along the shore, and has an average breadth of $8\frac{1}{2}$ m. reaching down to the beach. It is bounded on the S. by the small river Adyar, which is not navigable; and another rivulet called the Kuam, and a canal which is now navigated by steam, flow through it. The European residents occupy light two-story dwellings in the outskirts or suburbs, with compounds or enclosures around them thickly planted with shade trees. The principal shops are in the quarter called the Black town, which is crossed N. and S. by 8 good avenues. The minor streets, inhabited by the natives, are narrow and dirty. The custom house, some of the courts and other government buildings, and the warehouses and offices of the principal European merchants, are built along the beach; and here too are the principal drive and promenade, and the strong and handsome fortress called Fort St. George, with barracks for troops and a double line of bomb-proof defences on the land side. It has accommodations for 1,000 men. Adjoining it is a fine esplanade, protected from the encroachments of the sea by a stone wall. The principal public buildings of Madras are the government house, mint, exchange, bank of Madras, government savings bank, general and naval hospitals, male and female orphan asylums, post office, the pantheon (comprising a theatre, ball rooms, &c.), St. George's cathedral, St. Andrew's (Scotch) church, the Roman Catholic cathedral, about 20 other places of worship, 7 or 8 of which belong to the established church, one to the American mission, and one to the Armenians, a mosque, and several unpretending Hindoo and Mohammedan temples. The chief establishments for education are a university, comprising primary and high schools, and a college (which is now however virtually extinct), a successful medical school for the natives, a polytechnic institute, and a literary institute. There are agricultural and horticultural societies, a botanical garden, a good museum, and a government observatory. The periodical press comprises 9 or 10 weekly, semi-weekly, and tri-weekly, 2 semi-monthly, 7 monthly, and 2 quarterly publications. Madras is supplied with excellent water from wells in the Black town; it is conveyed in pipes to two reservoirs, and thence distributed through the city. The streets have been lighted with gas since Nov. 1859.—Madras is totally destitute of a harbor. Large ships are obliged to anchor about 2 m. from the beach in 9 fathoms of water, and landing is effected by boats called masulaha, built of thin planks, flat-bottomed, without ribs or keel, and so flexible as to yield to the impulse of the breakers. The greatest skill is required to conduct them through the tremendous surf, in which no boat of ordinary construction could live a moment. Throughout the S. W. monsoon the anchorage is extremely hazardous, and ships are often obliged to cut loose their anchors and put out to sea. The building of a pier was

begun in 1859. An attempt has been made to construct a breakwater, but with no success. Notwithstanding these drawbacks, the commerce of Madras is very large, as appears by the following table:

| Years. | Imports. | Exports. |
|-----------|------------|------------|
| 1858..... | £1,110,589 | £1,008,877 |
| 1859..... | 1,226,727 | 974,238 |
| 1860..... | 1,014,050 | 1,048,609 |

The settlement of Madras dates from 1689, when Mr. Francis Day, chief of the British factory at Armegon, the first English settlement on the Coromandel coast, removed his establishment to this spot, and built Fort St. George on a small tract of territory granted by a native prince. The presidency was created in 1688. The settlement was known at first as Chenappatam, but in official documents the city still retains the name of Fort George. In 1702 it was blockaded by Daoud Khan, a general of Aurungzebe; in Sept. 1744, after 8 days' bombardment, it surrendered to the French under La Bourdonnais; and in 1768-'9, having reverted to Great Britain by the peace of Aix la Chapelle (1748), it underwent a siege of two months by a large French and native force under Lally. The assailants were finally driven off, leaving all their sick, 52 pieces of cannon, and most of their stores.

MADRAZO, JOSÉ Y AGUDA, a Spanish painter, born at Santander, April 22, 1781, died in Madrid, May 8, 1859. He pursued his studies at the academy of Madrid, in Paris under David, and in Rome, where he spent several years, having been sent there by the king of Spain. In 1818, on his return to Madrid, he became director of the academy, and afterward of the museum. His principal works are: "Jesus in the House of Ananias," the "Sacred Heart of Jesus," the "Battle of Cerignola," the "Seizure of Breda," the "Storming of Montefrio," and an admirable portrait of the present empress of France. His sons, Federico and Luis are among the most distinguished living artists of Spain, particularly the former, who was born in Rome in 1815, and excels as portrait painter.

MADREPORE. See CORAL.

MADRID, the metropolis of Spain, situated in the centre of the peninsula, about 2,000 feet above the level of the sea, on the left bank of the Manzanares, crossed here by magnificent bridges, in lat. $40^{\circ} 25' N.$, long. $3^{\circ} 42' W.$; area nearly 5 sq. m.; pop. in 1857, 281,170, including upward of 25,000 foreigners, chiefly French. It is connected with the Mediterranean by the recently opened railway to Alicante *via* Aranjuez and Almansa; distance from the former city 282 m. The projected railway to Bayonne (240 m.) will establish a direct communication between Madrid and Paris. A railway to Valencia is in course of construction, and one to Lisbon (320 m.) is also contemplated. Madrid is placed in the midst of a desert-like region, and even within a short distance from the gates there is hardly any sign of the vicinity of a great capital excepting the fantastic spires of the churches. The barrenness of the environs, the

prevailing sharp E. and N. E. winds, and the excessive cold in winter and heat in summer, render the climate dangerous to persons of delicate constitution, especially to those suffering from pulmonary complaints. A great improvement, however, as far as the supply of water is concerned, is insured by the new reservoir, which is to bring the waters of the Lozoya into the city by an aqueduct 40 m. long, at a cost of about \$5,000,000. Madrid is surrounded by a wall 20 feet high. The 5 principal gates are those of Alcala, Bilbao, Segovia, Toledo, and Atocha. The best approach to the city is by the Saragossa road, and the *puerta* of Alcala, which is the handsomest gate of Madrid. The city contains upward of 8,000 houses, arranged like those of Paris for several families on different floors, 500 streets, over 70 squares and places, and numerous fountains and public wells. The streets in the old quarters, built before Madrid was the metropolis, are narrow and crooked, especially in the S. W. part of the city. In the E. and more modern part they are well paved, spacious, and lighted with gas. Nearly in the midst of the capital is the Puerta del Sol, said to have once been the eastern gate, but now an open square, from which the principal streets radiate, that of Alcala running E. N. E., the Calle Mayor W., that of Montera N., and that of Las Carretas S. The Puerta del Sol, close to the *bolera* or exchange, is the daily resort of a vast number of people, uniting the social features of a club with the advantages of a public lounging place. For the want of activity and enterprise of the metropolis, a compensation is afforded here in the discussion of the topics of the day, particularly those of a political and scandalous nature. While the ladies of Madrid see each other in the churches, the gentlemen meet in the Puerta del Sol. It is at the same time the resort of adventurers, beggars, newspaper vendors, and of other persons, among whom the *pretendientes* and *cesantes*, or office-hunters, and the *empleomanicos*, or corrupt office-holders, are more or less conspicuous. For the purpose of operating against this central hotbed of agitation in case of emergency, a military post is maintained in the *casa de correos* (post office) on the S. side of the Puerta del Sol. The most fashionable shops are in the streets clustering round this neighborhood. The various mail offices and electric telegraphs are also there, and the custom house is in the vicinity. The Calle de Alcala, $\frac{1}{2}$ m. in length, is the finest street in Spain, and one of the finest in Europe. Among the other most fashionable streets are those of Montera and Las Carretas, abounding with elegant shops. The largest square, with the exception of the space fronting the palace, is the Plaza Mayor, 430 feet long and 330 broad. The chief streets running into it are those of Atocha and Toledo, the latter passing through the Plaza de Cebada and through the gate to the bridge of Atocha. To the left and outside of the gate of Alcala is the Plaza de Toros,

where the famous bull fights are held, a large circular structure, about 1,100 feet in circumference, and accommodating from 12,000 to 15,000 spectators. It belongs to the government, and the profits are used for public charities. Here from April to November bull fights take place every Monday afternoon, and sometimes on Sundays. The bulls generally come from the pastures of the Jarama. Beyond the pavements, and yet within the gates of the capital, is the Prado, the Hyde park of Madrid, nearly 2 m. long, and comprising extensive pleasure grounds. Mr. Bryant, who visited the Prado in Nov. 1857, says: "Every afternoon in fine weather at this season, a dense throng of the well dressed people of the capital walk up and down the Prado till the twilight warns them home. They move with a leisurely pace between the colossal lions of white marble which form the fountain of Cybele on the north, to those of the sea monsters of the fountain of Neptune on the south; and then turning, measure the ground over again and again, till the proper number of hours is consumed. The men are unexceptionably dressed, with nicely brushed hats, glittering boots, and fresh gloves; the favorite color of their kids is yellow; the ladies are mostly in black, with the black veil of the country resting on their shoulders; they wear the broadest possible hoops, and skirts that trail in the dust, and they move with a certain easy dignity which is thought to be peculiar to the nation. On these occasions a dress of a light color is a singularity, and a bonnet attracts observation. Close to the walk is the promenade for carriages, which pass slowly over the ground, up one side and down the other, till those who sit in them are tired. Here are to be seen the showy liveries of the grandees and opulent hidalgos of Spain and of the foreign ambassadors." The most frequented portion of the Prado, *el salon*, extends from the Calle de Alcala to the Calle de San Jeronimo. Other public but less frequented walks are the gardens of the Buen Retiro, the Florida, the Delicias, and Chamberi, the last outside the gate of Bilbao, and a resort of the humbler classes of citizens.—The churches of Madrid are unworthy of notice, except those of San Isidro and of the convent of La Encarnacion. The *iglesia mayor* and the most ancient church, originally a Moorish mosque, is that of Maria de la Almudena. The city formerly abounded with chapels and convents, and still contains over 60; but many have been pulled down or converted to other purposes. Near the Pelota gate are the remains of the convent of San Jeronimo, which was once the Westminster abbey of Spain, but the sepulchres collected there were destroyed during the French invasion. The most conspicuous public building is the royal palace, with two open plazas, that to the E. being called the Plaza del Oriente, occupying with its pleasure grounds nearly 80 acres on the E. bank of the river. The magnificence of the interior is perhaps not surpassed in any palace

of Europe. The ceilings were painted by Velasquez, Mengs, and other eminent artists; the richest marbles and mirrors adorn the walls. Many of the best pictures, however, have been removed to the gallery in the Prado. The armory, occupying the S. façade, contains collections of weapons of all ages, and is peculiarly rich in Moorish arms and accoutrements. The other principal public buildings are the new palace of the cortes, opened in 1850, in the square of the same name; the Buena Vista palace, now used as a museum of civil engineering; and a number of private palaces, the most remarkable of which are those of the dukes of Liria and Alba, with valuable picture galleries, and of the count of Altamira and the banker Salamanca. The royal museum of painting and sculpture, in the Prado, is one of the finest picture galleries in the world, containing the best productions of Murillo, Velasquez, and other great Spanish masters. One long room is almost covered with the works of Rubens; the Titians fill another room; and Paul Veronese is represented here almost as magnificently as in Venice. There are some very fine Guidos, and 10 pictures by Raphael, including his *Lo spazzino di Sicilia*, which is considered the best work in the museum. There are 23 pictures by Vandyke, a very large number by Teniers, and some of the finest landscapes of Claude Lorraine. The private gallery of Madrazo, who was until his death in 1859 president of the academy of fine arts, contains many works of the highest merit. Among the finest public monuments are an equestrian statue of Philip IV. in the Plaza del Oriente, a statue of Cervantes in the Plaza de las Cortes, and the monument dedicated to the memory of those killed by the French, May 2, 1808.—The hospitals of Madrid are numerous, and include several for foundlings, orphans, foreigners and strangers, and a military hospital. The principal charitable institutions are the royal hospital of San Fernando, resembling an English workhouse; the general hospital in the Calle de Atocha, accommodating nearly 2,000 persons, and also serving as a practical school for the students of the academy of medicine of both sexes; and the mendicity depot for the reception of paupers. Education is promoted by 60 public primary schools, by a number of colleges, and by religious and private institutions. Girls are chiefly educated in convents. The university of Alcalá was transferred to Madrid in 1836, and chairs of medicine, natural history, and astronomy were added to it in 1845. The great national library is in the royal palace, and the library of San Isidro has a large collection of books which formerly belonged to the Jesuits. Madrid possesses a botanic garden; an observatory; a museum of natural history, containing a collection of superb emeralds and fine ores of the precious metals; many learned and literary societies, at the head of which stands the Spanish academy; various establishments for the promotion of music and art; and

9 theatres, comprising the Teatro Real, one of the finest in Europe for the performance of Italian opera, the Zarzuela, for the exclusive performance of Spanish vaudevilles, chiefly adaptations from the French, and El Circo, famous for its scenic entertainments, consisting of the national dances. The number of daily journals is now (1860) about 25, including the gazette of the government. Clubs, coffee houses, reading rooms, cabs, and other conveniences for strangers are increasing in number.—The Madrilenians are noted for their imitation of French tastes, fashions, and modes of living. The higher classes keep late hours, rise late, and breakfast generally on chocolate. After the dinner follows the *siesta*, a season of almost universal repose. The shops are then closed, the windows shut, and scarcely any person is seen in the street; the stall keepers spread cloth over their wares, and even the Galician water carriers sleep upon their water casks. After the siesta the ladies lounge in the balconies and the gentlemen are engaged in smoking till the time for the promenade in the Prado, and the *tertulia*, a social meeting for conversation and music closing the day. Indolence is the characteristic of high and low. The workmen of the city are chiefly Catalans, Valencians, Aragonese, Asturians, and Galicians. The manufactures are inconsiderable, and almost all articles of trade and consumption are imported from foreign countries or from the Spanish provinces. Government manufactories exist of porcelain, tapestry, and carriages; but they are supposed to be as little profitable as the public saltpetre works and the mirror manufactory of St. Ildefonso. Butter comes from Aragon, oranges and lemons from Valencia, and dates from Murcia; and the markets are well supplied with fruit. Commerce is paralyzed by the absence of any navigable river and by the uninviting situation of the capital; but the financial operations and the transactions on the stock exchange, chiefly in Spanish securities, are of great importance. The principal bank is that of San Fernando. Notwithstanding the general laziness of the people, they are free from the drunkenness which is to be found among the lower classes in other countries, and highway robberies are comparatively rare, especially since the recent establishment of a police after the system of London. The government is paying more attention to the improvement of the city, and in the budget of 1859 23,000,000 reals were appropriated to public buildings in the Puerta del Sol and 4,000,000 to the mint. The savings bank of Madrid exhibits also a steady increase. In 1849 the deposits from 1,204 persons were \$100,000; in 1859, from 4,365 persons, they amounted to \$400,000.—Madrid is supposed to occupy the site of the Mantua Carpetanorum of the Romans, which was called Majoritum by the Goths and Majrit by the Arabs. The earliest authentic historical record of Madrid does not go back much beyond the early part of the 10th century. Under the rule of the Arabs it

was a mere military outpost, which was finally taken from them at the end of that century by Alfonso VI., who annexed it to the bishopric of Toledo, to which it still belongs. It continued to be an insignificant place till the reign of Henry III. of Castile, who resided there during the hunting season, the neighboring mountains abounding then with the wild boar and the bear. It first rose to importance under Charles V., who made it his occasional residence, and Philip II. at last made it his capital and only court in 1560. Madrid was entered by the French under Murat, March 28, 1808; but the heroic rising of the inhabitants (May 2) obliged them to evacuate the city. It was entered by Joseph Bonaparte July 20, and again evacuated Aug. 2. Napoleon finally took possession of it in December following, and King Joseph held it till 1813, when it was restored to Spain by the duke of Wellington.

MADRIGAL, a species of minor poem, having generally fewer verses than the sonnet or roundelay, and, unlike them, subjected to no stringent rules, the poet being allowed to follow his own convenience and fancy in the arrangement of rhymes and verses. With somewhat of epigrammatic terseness, it expresses in simple language tender and delicate sentiments, generally of an amatory or pastoral character, and occasionally ventures upon a higher strain of thought. It was very generally cultivated in Europe from the latter part of the 15th to the commencement of the 18th century, and appears to have been popular among the classical writers of antiquity, many of the shorter pieces in the Greek anthology and the works of Catullus and Martial, which are styled epigrams, being genuine specimens of the madrigal. The etymology of the word is involved in much uncertainty; but there is strong evidence that it is of pastoral origin and a native of southern Europe, although Dr. Burney and others derive it from the words *alla madre*, "to the mother," the beginning of certain hymns to the Virgin, on the supposition that the earliest madrigals were poems of this description; hence *madriale* and *madrigale*.—In music the madrigal is an elaborate vocal composition in 4, 5, 6, and sometimes 7 or 8 parts, of a rich and sonorous character, somewhat studied in its construction, and comprising imitations, canons, and fugues. Choron calls it a species of composition resembling the fugue, but the style of which, being less dry, admits of every kind of expression. Simple madrigals, which long antedated the opera, were for voices only; after them came accompanied madrigals, performed to the accompaniment of one or more instruments, and which were the immediate precursors of the opera. The former class were originally adapted to sacred words, and the music resembled that written for the church; hence the term spiritual madrigals, of which the celebrated psalms of Marcello, the Venetian composer, afford favorable specimens. From the middle of the 16th to the close of the 17th century, during which both classes were

most extensively cultivated, they assumed a freer style, and in the compositions of Palestrina, Luca Marenzio, Gesualdo the prince of Venosa, Monteverde, Mazocchi, and particularly of Alessandro Scarlatti, adequately interpreted the romantic and impassioned words to which they were adapted. In England during the Elizabethan period they reached a high degree of perfection, and among the prominent madrigal writers of the time may be found the names of Wilbye, Morley, Orlando Gibbons, and other composers, who vied with the best of their contemporaries on the continent. At the present day this species of composition may be considered to have been supplanted by motetts, or to have nearly passed away, although in the glee, the catch, and other forms of part songs its influence may still be traced. In England the "Madrigal Society," founded in 1741, has fostered a taste for madrigal music.

MADURA, or **MADOORA**, an island of the Asiatic archipelago, in the Sunda group, N. E. of Java, from which it is separated by a strait from 1 to 2 m. wide; it lies between lat. 6° 10' and 6° 45' S. and long. 112° 45' and 114° 5' E.; area, 1,260 sq. m.; pop. in 1850, 816,870. A chain of low calcareous hills runs through it from N. to S., but there are no high mountains. The geological formation and vegetable products resemble those of Java; the soil is generally poor, and a large part of it is uncultivated. The inhabitants are of the same race as the Javanese, and about on a level with them in point of civilization, but they speak a language of their own in two very distinct dialects, using the Javanese however in writing. They have a nominal sovereign who resides at Bangkallan, but the whole island is virtually subject to the Dutch, who first landed there in 1747. Great numbers of the Madurese have settled on the island of Java, where it is supposed that they number nearly 1,000,000 souls.

MADVIG, **JOHANN NICOLAUS**, a Danish philologist and politician, born at Svanike, in the island of Bornholm, Aug. 7, 1804. He completed his education at the university of Copenhagen, where in 1829 he was appointed professor of the Latin language and literature. Previous to that time he had acquired considerable reputation for philological learning by the publication of 8 works on the writings of Cicero, many of whose philosophical treatises he subsequently edited. He has also edited the works of Lucretius, Juvenal, and Livy, and in 1829 wrote a pamphlet to prove that the work *De Orthographia* of Apuleius, first published by Mai in 1828, was the work of a literary impostor of the 15th century. His *Opuscula Academica* (2 vols. 8vo., Copenhagen, 1834-'42) contain interesting documents and commentaries on many points in Roman history and antiquities. Among his remaining contributions to philological literature are: a "Glance at the Constitutions of Antiquity," "The Creation, Development, and Life of Language," "On the Fundamental Idea of Ancient Metres," a new "Latin Grammar for

Schools" (translated by the Rev. G. Woods, 4th ed., Oxford, 1859), &c. In political life he has favored the union of the Scandinavian nations, and has also labored earnestly as a deputy in the national diet to promote the interests of the university of Copenhagen. In 1848 he was appointed minister of public worship, which position he exchanged in 1852 for that of general director of public instruction.

MÆANDER (now *Meinder*, or *Boyuk-Meinder*), a river of Asia Minor, rising in Mt. Aulocrenas in Phrygia. It flows in a S. W. direction, and its remarkable tortuousness has caused its name to be used as a common word both in ancient and modern times. After leaving Phrygia, it passes into Caria, and has its outlet between Priene and Myus, in that part of the *Ægean* called the Icarian sea. Its principal tributaries are the Obrimas, Marsyas, Oludrus, Lycus, and Harpasus. The Mæander bears to the sea an immense quantity of mud, which, deposited at its mouth through a succession of ages, has extended the coast outward about 20 or 80 stadia, and joined several small islands to the continent. Its entire length is over 170 m.

MÆCENAS, **CAIUS CILNIUS**, a Roman statesman, born April 13 in some year between 78 and 68 B. C., died in Rome in 8 B. C. Though his family was only of the equestrian order, it was yet of high antiquity, deriving its descent from the Lucumones of Etruria, and said to number among its ancestors the famous Porseña. Mæcenas received an excellent education, and was well acquainted with Greek and Roman literature. His first connection with Octavius was probably in the capacity of tutor; and almost immediately after the appearance of Octavius on the political stage, we find the name of Mæcenas in frequent conjunction with his, as principal counsellor and minister. The first diplomatic business that Mæcenas conducted was the negotiation of a marriage, in 40 B. C., between Octavius and Scribonia, the sister-in-law of Sextus Pompey. His success in this affair led to his appointment, at a later period of the same year, to represent Octavius at the conference of Brundisium, where peace was made with Antony. During the war with Antony Mæcenas remained at Rome, and administered the civil government of Italy; and after the return of Octavius from the East, it was he who is said to have counselled him to retain the supreme power and establish the empire, while Agrippa was in favor of restoring the republic. The influence of Mæcenas over Augustus, and his participation in the government, still continued for a number of years; and when at length a coolness sprang up between them, he withdrew from the political world to a palace on the Esquiline hill which he had built, and which had long been the principal resort of all the wits and literati of Rome. Whatever may have been the misdeeds of Mæcenas as a patriot or a man, his liberal patronage of learning and genius has secured to him a lasting fame. Among

those who experienced his friendship and generosity, the most distinguished were the poets Horace and Virgil, the former of whom was indebted to him for an estate in the country of the Sabines, and the latter for the restoration of his hereditary property near Mantua, which had been seized by the Augustan soldiery in 41 B. C. Though a man of literary taste rather than of genius, he was nevertheless himself the author of some poems, dramas, and memoirs, all of which have perished save the fragments collected by Lion in *Mæcenatiana* (Göttingen, 1824).

MÆLAR, **MALAR**, or **MÆLAREN**, a lake of Sweden, extending from Stockholm on the E. to Koeping on the W., a distance of about 75 m., and comprising an area of about 800 sq. m. Its width is extremely variable. It has numerous arms branching off in all directions, and communicates with the Baltic by a canal called the *Soedertelge*, and also by a short channel, on the shores and on an island of which stands the city of Stockholm. It contains about 1,400 islands, and is noted for its picturesque scenery.

MÆLSTRÖM (Norwegian, grinding or whirling stream), an ocean current or whirlpool off the coast of Norway to the S. W. of the Loffoden islands, in lat. 67° 48' N. and long. 12° E. It runs between the islands of Værøe and Moskøe, or rather between Moskøe and a large solitary rock which lies in the middle of the strait dividing Moskøe from Værøe. According to the commonly received account of this whirlpool, the roar of its ebb equals that of the loudest cataracts, the noise being heard several leagues off; while its vortex is of such an extent and depth that if a ship comes within its attraction, it is inevitably absorbed and carried down to the bottom, and there beaten to pieces against the rocks, and when the tide changes the fragments are thrown up again. It was said that when the stream was most boisterous, and its fury heightened by a storm, it was dangerous to approach within several miles of it; that boats and ships have been destroyed by not guarding against it before they were within its reach; and that frequently whales came too near the stream and were overpowered by its violence and dashed to pieces in its depths. In the year 1645, says Jonas Ramus, early in the morning of Sexagesima Sunday, it raged with such noise and impetuosity that the very stones of the houses on the coast fell to the ground. Lord Dufferin, who cruised on the coast of Norway in 1856, was assured by intelligent inhabitants of the Loffoden islands that the stories about the Mæelström were ridiculously exaggerated. "On ordinary occasions," he says in his "Letters from High Latitudes," "the site of the supposed vortex is perfectly unruffled, and it is only when a strong weather tide is running that any unusual movements can be observed; even then the disturbance does not amount to much more than a rather troublesome race." "Often and often, when she was a girl," said his informant, "had his wife and her sisters sailed

over its fabulous crater in an open boat." Mr. Bayard Taylor, in describing his voyage on the Norwegian coast, also in 1856, says: "According to Captain Rûs and other modern authorities which I consulted, the Maelström has lost all its terrors and attractions. Under certain conditions of wind and tide, an eddy is formed in the strait, it is true, which may be dangerous to small boats; but the place is by no means so much dreaded as the Salten fiord, where the tide rushing in is caught in such a manner as to form a bore, as in the bay of Fundy, and frequently proves destructive to fishing craft. It is the general opinion that some of the rocks which formerly made the Maelström so terrible have been worn away, or that some submarine convulsion has taken place which has changed the action of the waters; otherwise it is impossible to account for the reputation it once possessed." From a statement made in 1859 by Mr. Hagerup, minister of the Norwegian marine, and by Major Vibe, superintendent of the Norwegian hydrographic surveys, who had personally examined the Maelström and made official reports upon it, the real nature of this famous whirlpool appears to be as follows. When the wind is steady and not too violent, boats may venture upon it in summer at flood or ebb tide, when it is still for about half an hour. At the point half way between flood and ebb it is most violent, and boats would then be in danger. At certain times it may be passed at any state of the tide by steamers and by large ships with a steady wind. But in winter and in storms it would be highly dangerous for any vessel to attempt to pass the Maelström. Its direction and violence are in a high degree dependent on wind and weather. When there blows on the sea a storm from the west, the stream in winter runs continually to the east at the rate of 6 knots an hour, without changing its direction with the rising or falling tide; and if at such a time the tide is rising, the stream becomes excessively violent and entirely unnavigable for steamers or any other craft. At certain states of the wind and tide in winter the whole stream boils in mighty whirls, against which the largest steamer could not successfully contend. These whirls, however, would not draw vessels to the bottom as was formerly believed, but would destroy them by dashing them against the rocks, or in case of small vessels by filling them and thus causing them to founder. There is no reason to suppose that the Maelström has been changed by any convulsion, or by the wearing away of the rocks. The official report further states that strong currents are very common on the Norwegian coast, and some of them are still more violent than the Maelström, though they do not, like that, have different courses at different points. One of the best known is Saltstrømmen, between Strømmee and Kanaplundæ, in Salten fiord in Nordland. This is a narrow sound about 900 feet broad, which connects Skierstad fiord, 30 miles long, with Salten fiord, and from the violence and turbulence of its currents this channel is often

utterly impassable. The current also between the islands Værde and Roet is very violent, and the direction of the stream goes the whole round of the compass in the course of 12 hours.

MAERLANT, Jaxon, a Dutch poet, born in Flanders about 1236, died in Damm, near Bruges, in 1800. His earliest poems, the "Trojan War" and "Alexander," imitations of the French romances of chivalry, are yet unprinted. He afterward devoted himself to the elaboration of biblical subjects, ecclesiastical and secular histories, or purely didactic themes. He is styled the father of Dutch poetry. Among his metrical productions are a life of St. Francis, in which he follows the Latin of Bonaventura (published by Tideman, Leyden, 1848); the *Heimelijkheid der Heimelikheden* (Dort, 1838), after the *Secreta Secretorum* falsely ascribed to Aristotle; *Wapens Martijn* (Antwerp, 1496; Dort, 1834), a dialogue between the poet and his friend Martin on the course of the world and various important questions; and *Van den Lande van Oersee*, an appeal for the deliverance of the Holy Land from the Saracens. He completed in 1270 a version of the Bible, and began in 1288 his *Spiegel historisch*, a chronicle of the history of the world, which was continued by others after his death. Portions of it have been printed (Leyden, 1784-'5; Amsterdam, edited by Bilderdijk, 1812). He was also a sculptor and painter.

MAES, or MAAS, NICOLAS, a Dutch artist, born in Dort in 1682, died in 1698. In his youth he went to Amsterdam and entered the school of Rembrandt, under whose instruction he became an excellent colorist. He painted small historical subjects, and subsequently portraits. His cabinet pictures are very scarce and bring high prices. His portraits are distinguished by vigor of coloring and skilful relief.

MAESTRICHT (Dutch, *Maastricht*), a city of Holland, capital of the Dutch portion of Limburg, situated on the left bank of the Meuse, 110 m. S. E. from Amsterdam, 56 m. E. from Brussels, and 14 m. N. by E. from Liège; pop. in 1854, 24,894. It is connected by a stone bridge 500 feet in length with the suburb of Wyck and the citadel of Petersberg on the opposite side of the river. Maestricht stands on a plain enclosed by hills, and, including the suburbs, is nearly circular in form. It is surrounded by walls and ditches, and is considered one of the strongest fortresses of Europe. Its principal defence consists of detached bastions and the fortress of Petersberg, which stands on a hill in the neighborhood of the city. The most remarkable objects of interest in Maestricht are the subterranean quarries under this hill, which cover a space of 18 m. by 6 m., the number of passages amounting to 16,000, 20 to 50 feet high and 12 broad. By means of sluices the surrounding country can be easily laid under water. The town is well built, and has wide and clean streets. The town hall is considered one of the finest edifices in Holland. There are 9 churches, 6 of which are Roman

Catholic and 8 Calvinistic, 4 hospitals and orphan asylums, and a public library. The manufactures are of woollen and cotton stuffs, leather, soap, tobacco, firearms, beer, and spirits. The city is connected by railroad with the principal cities of Belgium and Prussia. Maastricht has sustained many sieges. It was taken by the Spaniards in 1579, and most of the people massacred. Louis XIV. took it in 1678, and it was afterward unsuccessfully besieged by William of Orange. The Belgians attacked it in 1830 without success.

MAFFEI, FRANCESCO SCIPIONE, marquis, an Italian author, born in Verona, June 1, 1675, died there, Feb. 11, 1755. He was educated at the college of Parma. In 1698 he went to Rome, applied himself to poetry, and was received into the academy of Arcadians. He joined his brother Alessandro in the Bavarian service in the war of the Spanish succession, and was engaged in the battle of Donauwörth in 1704. His rank and accomplishments introduced him to the most cultivated society of Italy on his return. His acknowledged personal bravery gave dignity to his denunciation of the practice of duelling in his treatise *Della scienza chiamata cavalleresca* (Rome, 1710). He was one of the founders in 1710 of the *Giornale dei letterati*, the first literary journal in Italy, one of the objects of which was to acquaint the Italians with foreign literature. He aided in the reformation of the Italian theatre by his *Trattato dei teatri antichi e moderni*, and still more by his tragedy *Merope* (1718), which was received with great applause, and was declared by Voltaire worthy of the most flourishing period of Athens. His comedy *La cerimonia* was also successfully represented. The discovery of manuscripts in the cathedral of Verona directed him to archæological studies, and in 1781 he published his *Verona Illustrata*, abounding in antiquarian, literary, and historical details, written with a critical spirit and in an elegant style. He had a European reputation when in 1782 he began his travels in France, England, Holland, and Austria, collecting in France the materials of his *Gallia Antiquitates* (Paris, 1788). In England he was received at the court of George III., became a member of the royal society, and had the degree of LL.D. conferred on him by the university of Oxford. Among his works were 8 treatises against the prevalent belief in magic. He had a controversy with the Jansenists, through whose influence he suffered a brief exile when 70 years of age. A bust was raised to his honor by the academy of Verona during his life. His collected works were published at Venice in 1790, in 21 vols.

MAFFITT, JOHN NEWLAND, an American clergyman, born in Dublin, Ireland, Dec. 28, 1794, died in Mobile, Ala., May 28, 1850. He became a preacher in the Wesleyan connection in Ireland, and early gave promise of those remarkable powers as an orator that characterized him in after life. He came to the United States in 1819, and was admitted into the New

England Methodist Episcopal conference. During the 12 years that he remained in this conference he was appointed to some of the most prominent Methodist churches. At the expiration of the above period he removed to New York and took a local relation, travelling at his own discretion, and preaching, lecturing, and delivering addresses in various parts of the country. In 1838, conjointly with the Rev. L. Garrett, he issued in Nashville, Tenn., a weekly journal, entitled "Western Methodist," which has been continued under various names until the present time, the last being that of "The Christian Advocate," the central organ of the M. E. church, South. His labors as a preacher in the West and South were attended with great success. Wherever he went immense crowds were attracted to his ministry. In 1837 he was elected to the chair of elocution and belles-lettres in the La Grange college, Ala., which post he held until he was elected chaplain to congress in 1841. His residence was afterward mainly in the Atlantic cities until 1847, when, by misfortune growing out of a second marriage, he was obliged to leave for the South, and took up his residence in Arkansas, where he labored with some success for 2 years, at the expiration of which time he went to some of the chief cities of the South. The difficulties under which he labored pressed heavily upon his spirits, and he sunk under them. The power which he had over the masses, who had flocked in crowds to his ministry in other years, was gone, and after a brief period he died of a disease of the heart. His conduct was not always governed by due discretion, and his want of it in some instances brought obloquy upon him. Beside fugitive contributions to the press, he left an "Autobiography," "Calvary Tokens," and an "Oratorical Dictionary."

MAGADOXO, or MUKDISHA, an Arabian town on the E. coast of Africa, in lat. 2° 2' N., long. 45° 25' E., subject to the imam of Muscat; pop. 5,000. It is a place of considerable trade, being frequented by Arab and Indian vessels and a few European ships, and by caravans bringing grain, ivory, hides, horses, and slaves from the Galla countries to the west of it. Its imports are chiefly sugar, dates, firearms, and salt fish. The town is surrounded by a wall, and contains a mosque and about 150 houses of stone, the rest of the buildings being of wood. Magadoxo was a considerable town, strongly fortified, when in 1498 it was bombarded by the Portuguese squadron commanded by Vasco da Gama. It was subsequently subject to Portugal.

MAGALHAENS, or MAGELLAN, FERNANDO, a Portuguese navigator, born in Oporto in the latter half of the 15th century, killed at Mactan, one of the Philippine islands, April 27, 1521. Entering the Portuguese navy at an early age, he served for 5 years in the East Indies under Albuquerque, and participated with distinction in the siege of Malacca in 1511. Discontented with the inadequate recompense which he received for his services, he withdrew about 1517

with one Ruy Falero, a learned Portuguese astronomer, to Spain, where he made proposals for new discoveries to Cardinal Ximenes, the prime minister of Charles V. Believing with Columbus that it was possible to get to the East Indies by sailing westward, he succeeded in persuading the Spanish court that the Moluccas or Spice islands, then a much coveted possession, might be reached by a vessel taking that course, and thus be claimed by Spain in accordance with the compact between Spain and Portugal that all countries discovered 180° west of the Azores should belong to Spain, while all that were discovered east of that line should be the property of Portugal. A fleet of 5 vessels of from 60 to 130 tons, manned by 234 persons, was accordingly equipped, and under the command of Magalhaens sailed from Seville, Aug. 10, 1519. Making the coast of Brazil in the middle of December, he steered southward and entered the river La Plata; but finding that it was not a strait, he proceeded again to the southward as far as a harbor on the coast of Patagonia, lat. 49°, which he called Port San Julian. While wintering here he repressed with great decision, though perhaps with unnecessary cruelty, a conspiracy among the 4 other commanders of his squadron, who were Spaniards, and who hated him for being a Portuguese. Two of them were hanged, another was stabbed, and the 4th, with a priest, his accomplice, turned out of the ship and abandoned to the mercies of the Patagonians. Magalhaens quitted Port San Julian in Aug. 1520, having first taken possession of the country in the name of the king of Spain, and, proceeding still southward, on Oct. 21 entered the strait dividing the island of Terra del Fuego from the continent of America, which he called the strait of the Eleven Thousand Virgins, but which has ever since borne his name. On Nov. 28 the strait was cleared, and the fleet, now reduced by the desertion of one ship and the loss of another to 3 vessels, put forth into the vast expanse of sea beyond, to which, on account of the smoothness of its waters and the steady and gentle breezes which prevailed over it, Magalhaens gave the name of Pacific. They sailed over this untraversed ocean during the space of 3 months and 8 days, seeing no land but 2 sterile islands, and being gradually reduced to great hardships through disease and want of food. At length, on March 6, 1521, the fleet reached a group of islands, which, on account of the thievish propensities of the natives, Magalhaens called the Ladroneas, and on the 18th came in sight of Pamar, the first seen of the Philippine islands. Both groups were taken possession of in the name of the king of Spain, the latter being named by Magalhaens the archipelago of San Lazaro. According to the account of Pigafetta, the historian of the expedition, the natives of Zebu, at which the squadron arrived on April 7, and of several other islands, were converted to Christianity by the efforts of Magalhaens. Wishing to extend the field of conversion and subjugation,

he landed with 60 armed Spaniards upon the little island of Mactan, whose chieftain refused baptism. The islanders to the number of 1,500 opposed him with vigor, and Magalhaens, having exhausted his ammunition, commenced a retreat to his boats, in the course of which he was killed. The survivors of his party gained the ships with difficulty, and the expedition, reduced finally to a single ship and 18 men, reached Spain in Sept. 1522, under the guidance of Juan Sebastian Cano. This vessel, the Vittoria, was the first to make the circuit of the globe. In boldness of conception, in confidence in his opinions, and in patience and intrepidity, Magalhaens is justly considered to rank as an explorer next to Columbus, though necessarily at a long interval. His voyage from Spain to the Ladroneas, lasting 533 days, while that of Columbus to the nearest American land was of but 70 days' duration, was far the more perilous and arduous of the two; and although on this occasion he only made half the circuit of the earth, he is fairly entitled to the credit of being the first circumnavigator, from the fact that he had previously sailed from Europe to the eastward as far as Malacca, and perhaps still further. Possessing many of the qualities necessary to govern men, he was at the same time cruel and fanatical, and his death in a useless affray was the result of a rashness which frequently mastered his judgment.

MAGDALEN, MARY. See **MARY MAGDALEN.**
MAGDALENA, a N. department of New Granada, bounded N. and N. W. by the Caribbean sea, extending between lat. 7° 30' and 11° 40' N. and long. 72° 30' and 76° 5' W.; area estimated at 54,000 sq. m.; pop. 253,521. On the coast are the bays of Magdalena, Cartagena, and Morosquil. On the E. are several lateral ranges belonging to the Andes; elsewhere the surface is low. It is divided into the 4 provinces of Cartagena, Santa Marta, Rio Hacha, and Mompox.

MAGDALENA. I. A river of New Granada, which rises in the Andes near the frontier of Ecuador, in lat. 2° N., long. 76° 25' W., and after a sinuous course of 900 m. enters the Caribbean sea in lat. 11° N., long. 75° W. Its principal affluents are the Cauca, Bogota, and Sogamoso. The current is rapid and navigation difficult, but it is a route of considerable traffic, being the main channel of communication between the interior and the sea. It is navigable for small steamers to Honda, 540 m. from its mouth and 60 m. from Bogota, where further navigation is obstructed by cataracts. II. A river of Bolivia, called also Ubahy, Branco, and San Miguel. It issues from Lake Ubahy, in lat. 18° 20' S., and in its early course is called the Chiquitos. After flowing nearly N. about 500 m. it falls into the Guapora, in lat. 12° 20' S., long. 65° 5' W.

MAGDEBURG, a Prussian fortress, capital of the Prussian province of Saxony, on the left bank of the Elbe, 894 m. by railway S. W. from Berlin, 78 m. N. N. W. from Leipzig, and 300

m. N. W. from Cologne; pop. in 1858 of the town proper, consisting of the Altstadt, Stern, Citadelle, and Friedrichsstadt, 58,694, exclusive of 4,000 troops; and including the two suburbs Neustadt and Sudenburg, 76,116. The Altstadt, or the principal part of the fortification, extends along the river, and comprises 11 bastions. South of the Altstadt is the *Sternschanze* or star bastion, outside the Sudenburg gate, which is considered one of the strongest points. The two are connected by Fort Scharnhorst; and on an island of the Elbe, opposite the Altstadt, and united to it by a bridge, is the citadel, which serves also as a state prison, and in which Lafayette and Carnot were confined. Another bridge leads to the Friedrichsstadt or *Thurnschanze* (tower bastion), on the opposite or right bank of the river. The most remarkable of the 10 Protestant churches of Magdeburg is the cathedral, one of the finest Gothic monuments in N. Germany, surmounted by two towers about 350 feet high, with a nave 110 feet high, a pulpit of alabaster, now sadly mutilated, 45 smaller altars, with a great variety and beauty in the Romanesque capitals and tympana, and containing the bronze statue of Archbishop Ernest, the tomb of its founder, the emperor Otho the Great, and relics of Gen. Tilly. In St. Sebastian's church is the grave of Otto von Guericke, the inventor of the air pump. The equestrian monument of the emperor Otho in the Alte Markt, opposite the town hall, erected after his death at the end of the 10th century, is the oldest in the town. Luther once spent a year at the Franciscan school of Magdeburg, supporting himself by singing in the streets. Magdeburg is connected by steamers with Hamburg, and by railways with the principal towns of Europe. A canal commencing 20 m. below the town unites the Elbe with the Havel. The principal manufactures are beet root sugar and chemical products.—Magdeburg is of very ancient origin, and had the privileges of a town in the time of Charlemagne. A Benedictine convent was established there in 937 by Otho the Great, and an archbishopric in 967, which was raised by Pope John XIII. to the rank of primate of Germany. On account of its being among the first to embrace the reformation, the town was excommunicated, and was taken by the elector Maurice of Saxony in 1551 after a protracted siege. During the 30 years' war Magdeburg was subjected to great trials. It resisted the army of Wallenstein for 7 months, but was taken by the cruel Tilly in May, 1631, who carried it by assault and massacred 80,000 of the inhabitants without distinction of age or sex, reducing the town to ashes, excepting the cathedral and about 140 houses. In the despatch in which he announced the capture he wrote: "Since the destruction of Jerusalem and Troy such a victory has not been." Upon the house of the commandant, whom he beheaded, may be still read the words: "Remember the 10th of May, 1631." By the peace of Westphalia of 1648, the archbishopric of Magdeburg was allotted to the house of

Brandenburg. In 1806 the fortress, though garrisoned by a large force, was basely surrendered to the French by Gen. Kleist after 14 days' siege. The last siege was the obstinate one which it endured in 1813-'14.

MAGELLAN, or MAGALHAENS, a strait separating the continent of South America from the island of Terra del Fuego. Its entrance on the E. is between Cape de las Virgenes on the mainland, lat. 52° 18' S., and Cape Espiritu Santo on the largest island, lat. 52° 42' S., being 80 m. in breadth. On the W. the entrance is between Cape Victory, lat. 52° 16' S., and Cape de los Pilares, lat. 52° 46' S., 33 m. wide. Its total length is about 800 m., extending between long. 68° 20' and 75° W. The strait varies greatly in width, contracting at Cape Orange to 1½ m. The coasts are high and bold, rising to an elevation occasionally of 2,000 to 3,000 feet, and the navigation is difficult. It was discovered by the Portuguese navigator Fernando Magalhaens in 1520.

MAGENDIE, FRANÇOIS, a French physician and physiologist, born in Bordeaux, Oct. 15, 1788, died Oct. 8, 1855. He was removed at an early age to Paris, and became the pupil of the celebrated surgeon Boyer. At 20 years of age he was appointed successively *aide d'anatomie* in the faculty of medicine, and demonstrator. He, however, subsequently devoted himself principally to the practice of medicine, was in 1819 elected a member of the academy of sciences, and in 1831 succeeded Recamier in the chair of anatomy in the college of France, which he retained until his death. As an experimenter in physiology he occupied a high position, and his experiments on living animals were at one time so numerous and involved so much suffering to the animals, that the French government deemed it necessary to interfere. The results obtained, however, were of great importance, if they do not absolve him from the charge of cruelty. Among them may be named an original demonstration that the two roots of the spinal nerves are devoted to two separate functions; that the veins are organs of absorption; that strychnine acts upon the spinal cord and contracts by tetanic spasm the nerves of respiration, thus inducing asphyxia; that food destitute of nitrogen is not nutritious; and that prussic acid is a valuable remedy in certain forms of cough arising from irritation in the lungs. By means of numerous experimental researches upon the functions of the brain, its parts and nerves, he also greatly aided others in arriving at correct conclusions respecting these parts of the physical economy. He was a prolific author of medical works, the most important of which are: *Formulaire pour la préparation et emploi de plusieurs nouveaux médicaments* (1821), containing an account of the effects of certain plants then recently introduced into the materia medica, and which has been translated into all the languages of Europe; *Précis élémentaire de physiologie* (1816-'17), for many years an important manual for stu-

dents; *Leçons sur les phénomènes physiques de la vie* (1836-'42); *Leçons sur les fonctions et les maladies du système nerveux* (1839); and *Leçons sur le sang* (1839). He was also a contributor to the *Encyclopédie des gens du monde*, and to several medical dictionaries.

MAGENTA, a town of Lombardy, situated about 5 m. from the E. (left) bank of the Ticino, and 15 m. W. from Milan, with which city it communicates by railway and canal; pop. about 6,000. It is the first stage on the road from Novara to Milan, being nearly equidistant from the two places. On June 4, 1859, a great battle was fought here between the allied French and Sardinians, under the emperor Napoleon III. and King Victor Emanuel, and the Austrians commanded by Count Gyulai. The French assembled at Alessandria, having first deceived the Austrians by a march toward the E. in the direction of Piacenza, suddenly crossed the Po at Casale (May 31), and, while the Sardinians menaced the enemy's position at Mortara, midway between the Po and Ticino, moved toward the N., occupied Novara, and threw 8 bridges across the Ticino at Turbigo, about 8 m. above Magenta. The Austrians thereupon withdrew across the river into the Lombard territory and fortified the bridge of Buffalora, over which passes the road from Novara through Magenta to Milan; but on June 2 they were compelled to retire before a French corps under Gen. Espinasse, after an unsuccessful attempt to destroy the bridge. On the 4th McMahon's corps, followed by a division of the imperial guard and a division of the Sardinian army, having crossed at Turbigo, marched along the left bank toward Magenta, while the emperor in person advanced with the grenadier division of the imperial guard to occupy the bridge of Buffalora, leaving orders for Canrobert to follow. The latter was delayed, but the grenadiers began the contest unassisted at noon, and after 2 hours' desperate fighting captured the position and took possession of the heights on the canal, in the face of an Austrian force estimated by the French at 125,000. Gyulai at once despatched Baron Reischach to retake the bridge, but after a conflict of 2 hours more, in which it was 7 times taken and lost, the arrival of Canrobert, Regnault de St. Jean d'Angély, Neil, and Vinoy, turned the scale in favor of the French, though not until great loss had been suffered on both sides. The 3d Austrian army corps was ordered up from Abbiate Grasso on the S., and assailed the French flank with much spirit, but was finally compelled to fall back upon Robecco. In the mean time McMahon's advance from Turbigo had been several times checked by the enemy, who on evacuating Buffalora concentrated the principal part of their force between him and Magenta. A large detachment attempted to separate the divisions of La Motterouge and Espinasse, but was finally driven back by the voltigeurs of the guard under Gen. Canon, while the 45th regiment of the line made a heroic and successful attack upon a farm

house defended by 2 Hungarian regiments, and Gen. Auger planted a battery of 40 guns on the railway, from which he poured a tremendous fire upon the Austrians in flank. On reaching the town of Magenta, McMahon found it occupied by 7,000 of the enemy under Clam-Gallas, and the 2d army corps under Prince Liechtenstein. The combat here was terrible. Both sides felt Magenta to be the key of the position, and the attack and defence were conducted with equal bravery and determination. The French took it house by house, losing by their own account 1,500 men, but making 5,000 prisoners and placing 10,000 Austrians *hors du combat*. At 8½ P. M. Gyulai ordered a general retreat, leaving 4 guns in possession of the French. His official report gave his own loss at 9,718 killed, wounded, and missing, and that of the enemy at 6,000 or 7,000 killed and wounded. The French accounts acknowledge a loss of 4,957, and estimate that of Gyulai at 20,000, including 7,000 prisoners. The French generals Espinasse and Clerc were among the killed. The immediate results of the battle were the evacuation of Milan by the Austrians and its occupation by the allies. McMahon and St. Jean d'Angély were rewarded with the batons of marshals of France, and the former was also created duke of Magenta.

MAGGIORE, LAKE. See LAGO MAGGIORE.

MAGI, the priestly caste of the ancient Persians. It has generally been held that they were a Median race, and that the revolution which gave them their supremacy was a Median outbreak. It is, however, believed by Rawlinson that Magism was the old Scythic religion, which maintained itself in Persia after the Aryan conquest, and grew in power and influence despite the frowns of the court until Gوماتes, a Magna, was raised to the throne as successor of Cambyases. He was speedily overthrown and slain by Darius Hystaspes, and the Aryan religion was restored in triumph over Magism. Zoroaster was the reformer of Magism, which became the later Persian religion. The wisdom of the Magi caused a secret knowledge of religion and philosophy to be ascribed to them.

MAGIÖ, as explained by its adepts, the traditional science of the secrets of nature, embracing all knowledge, and constituting the perfection of philosophy; also the art of exercising preterhuman powers by means of occult virtues and spiritual agencies. Its highest professors have always claimed that it is chiefly esoteric, a *sanctum regnum*, fit only for kings and priests; and that to become master of its secrets requires superior intelligence enlightened by the severest study, an audacity which no peril can daunt, a will which no resistance can bend, and a discretion, devotion, and habitual silence undisturbed by the temptations of the world. They affirm that the reason, imagination, and will of man are instruments of incalculable power, and that some of their resources are known only to the magician; and they refer to Hermes Triemegistus, Osiris, Orpheus, Apollonius of Tyana, and

others, as persons of extraordinary attainments in magical arts, who have consequently been adored and invoked as gods after their death. Paracelsus inveighs against such as rank true magicians with conjurers, necromancers, and witches, "those grand impostors who violently intrude themselves into magic, as if swine should enter into a fair and delicate garden." Cornelius Agrippa reckoned 5 different kinds of magic. These, however, may be reduced to 2, the white or divine and the black or infernal magic. In the former, the devil devotes himself to the magician; in the latter, the magician devotes himself to the devil. The sorcerer, or practiser of the black art, differs from the true magician as the charlatan from the adept. The arts of magic are founded upon a pretended system of the universe, and have their root in astrology. Beside the 4 elements, fire, air, earth, and water, each with diverse potential characteristics, a 5th essential and superior element is introduced, variously called the astral light, the soul of the world, and the *primum mobile*, which is the grand arcanum of transcendental magic, the Tetragram of the Hebrews, the Azoth of the alchemists, the Thot of the gypsies, and the Tarot of the cabalists. By this element, which abounds in the celestial bodies and descends in the rays of the stars, every occult property is conveyed into herbs, stones, metals, and minerals, making them solary, lunar, jovial, saturnine, mercurial, &c., according to the planetary influences. Every thing human is represented in it, according to the Platonic notion, as Agrippa maintains, that every thing below has a celestial pattern. In its thoughts are realized, and images of past persons and things preserved, so that spectres may be evoked from it and the mysteries of necromancy accomplished. It is thus because they are merely spectral that spirits are said never to cast shadows. The signs printed in it are reproduced on all bodies, men having the signs of their star on their brow and in their hands, by which their destiny may be read from the beginning. Hence the astral cabalistic alphabet of Paracelsus and Gaffarel. Separated and extracted from matter, it is the philosopher's stone and the elixir of youth. To have command of this element, to direct its currents and to discern its moving panorama, is the highest attainment and the incommunicable secret of the magician. To reveal it is to lose it; to impart it even to a disciple is to abdicate in his favor. According to Eliphas Levi, one of the most erudite recent writers in illustration and defence of magic, the famous prophetic dinner related by La Harpe, at which Cazotte before the outbreak of the French revolution foretold to his listeners its horrors and precisely their own mode of execution, has never been correctly understood. According to him, all the men present at the dinner, except La Harpe, had been initiated into societies of magic and illuminism, and had profaned the mysteries. Cazotte had advanced further than they in the scale of initiation, had a higher au-

thority, and therefore in condemning them to the penalty of death was pronouncing their sentence rather than predicting their future. The powerful association only availed itself of the course of events to rigorously execute the sentence. A fundamental principle of magical science is the universal mutual relation of every thing in nature, the necessary chain of all effects and all causes, the slightest event being often momentous with the greatest consequences. Thus, from occult relations, Cæsar is said to have been assassinated because he blushed at being bald; Napoleon to have died on St. Helena because he liked the poems of Ossian; and Louis Philippe to have been dethroned because he possessed an umbrella. These hidden connections are symbolized in magical numbers and words, and are revealed by fantastic but scrupulous ceremonies.—The ultimate magical force, however, is the will; and ceremonies, vestments, perfumes, numbers, written characters, and symbols are useful only as means of educating and concentrating the will. All the mysteries of magic, all occult gnostical symbols, all the cabalistic keys of prophecy, are summed up in the pentagram or flamboyant 5-pointed star, the sign of the microcosm and of intellectual autocracy, and the most powerful magical instrument. This mysterious figure must be consecrated by the 4 elements, breathed upon, sprinkled with water, and dried in the smoke of precious perfumes; and then the names of great spirits, as Gabriel, Raphael, Orphiel, and the letters of the sacred tetragram and other cabalistical words, are whispered to it, and are fantastically inscribed upon it. In magical ceremonies, which must always be performed with minute exactness, it is placed on the altar of incense under the tripod of invocation. The operator should also wear it on his person together with the figure of the macrocosm, a star of 6 rays, composed of two triangles crossed and interlaced. In various positions it invokes good or bad spirits, and expels, retains, or captures them. Occult qualities are due to the agency of elemental spirit. The magician can become their master only by surpassing them in courage in their own elements. The terrors of initiation into ancient mysteries and mediæval magical rites were designed to test and prove the strength and daring of the candidate. The man who has demonstrated his fearlessness amid conflagration, shipwreck, tempest, and darkness, terrifies the salamanders, undines, gnomes, and sylphs into obedience, and can then evoke them from the fire, water, earth, and air. There are divers modes of divination by the 4 elementary substances, called respectively pyromancy, hydromancy, geomancy, and aeromancy. The magician should be impassible, sober, chaste, disinterested, inaccessible to prejudice and terror, and without physical defect. An impassioned ecstasy may sometimes have the same power as this absolute intellectual superiority, but is not to be depended on. He should not live exclusively in his laboratory, with his

Athanasior, elixirs, and crucibles. The intense mental concentration required by every magical operation should be followed by a period of repose. It is claimed that a traditional key to magical arts has been preserved from the time of Solomon, its use being permitted only to the highest priests and to the élite of the initiated. This key is a hieroglyphical and numeral alphabet, expressing by characters and numbers a series of universal and absolute ideas. It has 4 symbols bound together by 12 figures, representing the 4 great geni of the 4 cardinal points united by the 12 signs of the zodiac. The symbols of this key with all their analogies explain all mysteries, the ancient magic, the cabala, and the 7 magical planetary squares of Agrippa and Paracelsus. To its 24 letters correspond the 22 keys of the cabalistic Tarot, explained by Court de Gébelin, and known to the Rosicrucians and the Martinists. Thus revealed, the Tarot is a veritable oracle, and of itself would furnish a universal science and an exhaustless eloquence. It was the great secret of Raymond Lully. The celebrated word *abracadabra* formed the magical triangle of pagan theosophers, to which extraordinary virtues were attributed. It symbolizes the whole magical science of the ancient world. The trident of Paracelsus was believed by him to have all the virtues which the cabala attributed to words, and which the hierophants of Alexandria ascribed to the *abracadabra*. A complete knowledge and mastery of nature is the transcendent claim of magic. To know things secret and future, to command the elemental spirits, to heal the sick, to provide charms and talismans which shall mysteriously sway the will of others, render one's self invulnerable, and raise tempests, to constrain the devil into service, to evoke the dead, to possess the philosopher's stone and the elixir of life, are the usual objects of magical arts. The highest success can be attained only by the most disinterested purposes and the most unswerving devotion. Thus those who have been believed to have possessed the secret of making gold, as Nicholas Flamel, passed lives of poverty and privation, while they made princely distributions of wealth.—Though magic has generally ceased to be an object of serious attention, being regarded by enlightened nations as a chimerical science, yet it has had a history which links it on the one hand with the highest themes of symbolism, theosophy, and early science, as well as on the other with the ridiculous or tragical delusions of the many forms of demonomania. It played an important part in the religious doctrine and ritual of the ancient Persians, and magical arts have always remained in vogue and authority almost throughout the East. The Greeks borrowed the name from the Chaldeans, and applied it to all divinations and thaumaturgy. Schelling in his work on the divinities of Samothrace suggests that "in the Greek mythology the ruins of a superior intelligence and even of a perfect system were to be found, which would reach far beyond the

horizon which the most ancient written records present to us." He adds that portions of the same system may be discovered in the Jewish cabala. The Alexandrian philosophy, which mingled the ideas of the East and the West, attached importance to magic, under the influence of which theurgy became a prominent part of the declining pagan doctrine. The Mosaic law had recognized and proscribed magical arts, and Christianity renewed the interdiction, ascribing its marvels to malignant spirits. Magic in connection with fantastic Neo-Platonic theories was the last remnant of paganism, and was practised in secret. To its long and hidden culture under proscription, the mediæval conception of the sabbat, or midnight assembly of witches, has been attributed. Celtic, Germanic, Latin, and oriental ideas all combine in the Christian history of magic. To the mediæval mind, Aristotle, Virgil, Solomon, and Alexander the Great were alike magicians and enchanters. Gerbert, who was afterward Pope Sylvester II., scarcely escaped condemnation for sorcery. Albertus Magnus, Roger Bacon, Raymond Lully, and Pico della Mirandola studied the cabala and prosecuted original inquiries. Faust enjoyed unrivalled celebrity in Germany. Near the time of the renaissance appeared the Rosicrucian theory of sylphs, gnomes, undines, and salamanders, and their various powers. The classical scholar Reuchlin devoted himself with great ardor to the investigation of the cabala, embodying the result in his works *De Verbo Mirifico* and *De Arte Cabbalistica*. Buxtorf, Schiokard, Hottinger, Athanasius Kircher, and Knorr von Rosenroth followed in his footsteps; the *Cabbala Denudata* of the last is of especial merit. The works of Trithemius, Cornelius Agrippa, Paracelsus, and Van Helmont developed the subject, and the writings of Jacob Böhme, St. Martin, and Henry More are important with reference to it. Cardan was believed to be one of the most learned and successful practitioners, though according to some accounts he committed suicide in order not to give the lie to his horoscope, which he had prepared with great care. Though the legitimacy of magic was disputed, its reality as an art and a science was scarcely doubted from the 15th to the 18th century. It has still in Europe a few learned and respectable professors and adepts, while throughout the Mohammedan and pagan world its reality is almost universally admitted, and its professors are still numerous.—For the discipline and ceremonies of the art, as now maintained, see Eliphas Levi, *Dogme et rituel de la haute magie* (2 vols., Paris, 1856). To attain the science, according to this work, not only a severe intellectual and moral training, but also a theosophical genius and a wide erudition, are essential. For various information on the subject, see Horst, *Von der alten und neuen Magie Ursprung, Idee, Umfang und Geschichte* (Mentz, 1820); Grasse, *Bibliotheca Magica et Pneumatica* (Leipsic, 1848); and Ennemoser, *Geschichte der Magie* (2d ed., Leipsic, 1844;

translated into English by William Howitt, 2 vols., London, 1854).

MAGIC LANTERN, an optical instrument intended for exhibiting, by means of lenses, magnified images of pictures painted in variously colored transparent gums, on glass slides. It is constructed upon the simple dioptrical principle of conjugate foci (see *OPTICS*), in accordance with which, when any object, as a picture, is brought upon one side of a convex lens, and at a distance slightly greater than its focal length, such object or picture will be reproduced upon a white screen placed at a certain distance on the opposite side of the lens (the axis of the lens, picture, and light illuminating it being supposed to be in the same straight line), and the distance at which a distinct image will be formed on the screen increasing as the picture itself is brought nearer to the focus. In the common form, used for schools or scientific purposes, the instrument consists of a large dark lantern, having at top a bent chimney for the escape of smoke or heated air, and an opening on one side on a level with the flame of a strong lamp within; the side of the lantern opposite the opening being faced with white pasteboard, or furnished with a parabolic metallic reflector, for the purpose of collecting the light and throwing it upon a convex lens in the orifice already referred to. Just outside this lens, within a horizontal tube, the picture or slide is introduced, being of course changeable at pleasure; and beyond this is a second convex lens, a little further than its focal length from the picture, and the distance of which from the latter is regulated by an arrangement for sliding it within the tube. By the action of the reflector and the first lens, a strong light is condensed upon the picture; and its pencils, being converged and made to cross by the second lens, form at their several foci the image, which, being received at that place by the screen, is rendered visible. The inversion of the image is corrected by placing the slides inverted. By undue enlargement the image is rendered indistinct, in consequence not only of diffusion of the light over a larger surface, but also of increasing spherical and chromatic aberration. So far, therefore, as the power of the light admits, it is better to gain increased size in the representation by enlarging the picture used. The image may be shown either by reflection from an opaque screen, as one of strong white paper on canvas; or by transmitted light, in which case the screen may be of fine white muslin moistened with water or oil. The linear magnifying power is equal to the distance of the image from the outer lens divided by the distance of the latter from the picture. For exhibitions before large audiences, the lime light, obtained by keeping a cone of lime ignited in the flame of the oxy-hydrogen blowpipe, and revolving at the same time, has been much used; but the apparatus now prepared by M. Duboscq and others, enables the experimenter to employ the most intense artificial light known,

that of the galvanic current passing between charcoal points; and some of its forms have two reflectors so placed as to throw the images of two pictures at the same time on the same part of the screen, as is required for the effects known as "dissolving views." These effects consist in gradually covering one slide, while the other is uncovered, thus causing one scene to fade or melt into another, as a day into a moonlight scene, and so on. Another curious effect secured by the lantern is that termed the "phantasmagoria;" in which, by bringing the instrument close to the screen, the image is very small, and in a darkened room seems proportionally distant; then, removing the instrument backward, and keeping the lens properly focused, by slightly shifting its place, the enlarging figure seems to be rapidly approaching the spectators, thus forming a complete illusion.

MAGINDANAO. See **MINDANAO**.

MAGINN, WILLIAM, LL.D., a British author, born in Cork, Nov. 11, 1794, died in Walton-on-Thames, near London, Aug. 21, 1842. His father was a classical teacher, under whose care he evinced remarkable aptitude for learning, and in his 10th year was admitted to Trinity college, Dublin. Though one of the youngest of the competitors on entering, he was one of the most advanced, and he maintained his distinction for scholarship throughout his university career. Returning to Cork, he became assistant in his father's school, after whose death in 1818 he successfully conducted it himself for 10 years. His wit and culture made him at the same time the delight and ornament of society. At 28 years of age he received the degree of LL.D. from his *alma mater*, being the first who had ever obtained it so young. Having already contributed in prose and verse to various periodicals, in 1819 he translated the old ballad of "Ohevych Chase" into Latin verse for "Blackwood's Magazine," nearly every number of which from that time for many years contained one or more articles by him, usually displaying at once his wit, scholarship, and Toryism. He soon assumed the sobriquet of Morgan Odoherthy, under which he figures in the "Noctes Ambrosianæ." On a visit to Edinburgh in 1820 he for the first time became known personally or by his own name to the publisher and leading writers of the magazine. In 1828 he married, and determined to make literature his profession. In London he wrote for several journals and for the "Quarterly Review;" and so high were his abilities rated that he was at one time selected in preference to Moore to receive the papers and write the biography of Lord Byron. When in 1824 John Murray started his daily journal, the "Representative," Maginn was sent to Paris as foreign correspondent. The "Noctes Ambrosianæ," in "Blackwood," were due to his suggestion; he wrote the whole of the 4th number of them, and furnished various brilliant poems for them throughout the series. In 1828 he became junior editor of the "Standard," a London evening and ultra Tory journal. During

the same year he wrote several stories for annuals, and the political novel "Whitehall, or the Days of George IV." He was one of the projectors of "Fraser's Magazine" in 1829, for which he wrote largely. The brief, lively, and sarcastic descriptions which accompanied the series of portraits of the principal contemporary British authors were, with one or two exceptions, written by him. In 1836 a severely personal critique in "Fraser" on a novel by the Hon. Granville Berkeley led to a duel between the author and critic, in which the parties fired 3 shots each, and left the field without exchanging a word. In 1837 he began his "Shakespeare Papers," and the first of his 16 Homeric ballads appeared in 1838. The remainder of his life was made unhappy by habits of intemperance, to which his social and jovial qualities specially exposed him. His irregularities caused his connection with the "Standard" to be broken off, and to a great extent excluded his contributions from "Fraser." In 1839 he became editor of the "Lancashire Herald," a weekly journal in Liverpool; but his articles were rarely good, and the proprietor failed. He returned to London in 1839 with a few chapters of a romance, entitled "John Manesty, the Liverpool Merchant," which was completed after his death by Charles Ollier, and published for the benefit of his family. In 1840 he began a weekly issue of "Magazine Miscellanies, by Doctor Maginn," which were badly conducted and extended only to 10 numbers. He was beset by creditors, and in 1842, being cast into Fleet prison for debt, he obtained his liberty by passing through the insolvency court. With broken health, and with distinction as an able and consistent champion of torism for a quarter of a century, he was disappointed in not obtaining an appointment when his party came into power. He was however personally remembered by Sir Robert Peel, who delicately sent him £100. Beside his papers in "Blackwood," "Fraser," and the "Quarterly," he wrote many others, equally marked by wit and scholarship, for "Bentley's Miscellany" and the first two volumes of "Punch." His "Fraserian Papers," "Odohart Papers," "Homeric Ballads," and "Shakespeare Papers" have been collected and edited by R. S. Mackenzie (5 vols., New York, 1855-'7).

MAGLIABECCHI, ANTONIO, an Italian scholar, born in Florence in 1683, died there, July 4, 1714. After receiving a very imperfect education, he was apprenticed to a goldsmith in his native city, but ultimately abandoned his trade, and devoted himself to literature. He attracted the notice of Michele Ermini, librarian to Cardinal de' Medici, under whose instruction he acquired a thorough knowledge of Latin, Greek, and Hebrew. Cosmo III. appointed him his librarian, in which congenial situation he grew so absorbed in his books as to disregard the ordinary comforts and pleasures of life. He usually passed the whole night in study, and when exhausted nature demanded rest, a wretched straw chair served him for a couch, and an

old threadbare cloak for a coverlet. His memory was prodigious. Though his library was large, and always in such disorder that it was often necessary to remove 100 books to get at one, yet if any person came to consult him about a passage, he could both tell the very page of the work where it was to be found, and point out the very place in the pile where the volume lay buried. By the time of his death he had accumulated a library of 80,000 volumes, which, with funds for its preservation and enlargement, he bequeathed to the city of Florence. It is known by the name of Magliabecchiana, and is open to the public. We owe to Magliabecchi the preservation of many works that had long lain in manuscript in the Laurentian library of the Medici. He produced no literary work of his own.

MAGNA CHARTA, the GREAT CHARTER, or the "Charter of Liberties," as it is commonly called by English writers. Our word charter shows that the Latin *charta*, which meant simply paper, was at length used in the sense of a legal instrument, much as the word paper is sometimes used now. The word charter was however most commonly used to signify the written evidence of grants of land or of privileges from a feudal lord to an abbey or other religious house. From this it was extended to mean the records of all grants from feudal superiors to their subordinates, whether civil or ecclesiastical, and all agreements between them. The Great Charter is of this description, but is from the sovereign to the people. It begins: "John, by the grace of God, king," &c., to various dignitaries and officers, describing them not by name but by office, and "his other faithful subjects: Know ye, that we, for the health of our soul, &c., and by the advice of (sundry persons enumerated), have granted . . . and confirmed, for us and our heirs for ever." But while, in form, the charter was only a gift of certain rights and liberties by the king, it was a very different thing in fact. The Anglo-Saxon institutions and usages, which were very favorable to liberty, had been almost suppressed by the Norman conquerors. The Norman kings, perhaps from the necessity which belonged to their position in England as sovereigns of an invading and conquering race, who needed to hold full and unchecked powers to enable them to preserve what they had won, had claimed and exercised an almost despotic authority. This began to alarm and perhaps to oppress the nobles; and after some struggles and conflicts the feudal possessors of the land of England succeeded in wresting from the feeble hands of John the important concessions contained in the Great Charter. These were very far, however, from being original concessions. There is scarcely one of them, of any importance, which may not be traced back in its principle, if not in its form, to Anglo-Saxon times. The nobles found that these usages, or principles, were all that they wanted to secure their own rights; and by demanding them only they secured the coöperation of a great part of the

clergy and of all the cities and burgesses, and thus were enabled to gain such a superiority over the forces which John could bring to his aid, as to compel him to a peaceful acquiescence in their demands. The preliminaries were agreed upon; the principal provisions of the charter were determined upon and ratified in a preliminary instrument by the king; and then he met the deputies of his nobles, and some of his clergy, at Runnemed, and there, on June 15, 1215, the charter was executed. It bears the seal of the king, and of a large number of nobles. Many copies were made at once, probably one for each county and diocese, and for some other bodies. Two of these originals, for all may be called so, are still preserved in the Cottonian library in the British museum; and there are copies extant made at later periods. Some doubt still rests upon the text, however, in passages of some importance. That printed at the beginning of the first volume of "Statutes at Large," in folio, is in fact a translation of the great charter of Henry III., which purported to be a confirmation of the charter of John. It was however duly enacted by the three estates of parliament, which the charter of John never was. Sir William Blackstone published an edition of it from the Cottonian original (Oxford, 1759). It was drawn up in the Latin language, and the translations into English vary considerably. Professor Bowen of Cambridge, Mass., published one in 1854, made by himself, with other documents illustrating the constitutions of England and America. His translation has the merit of literal accuracy, but therefore is open to some of the uncertainties which belong to the original. Thus the famous section 45 (so in Bowen's edition, sometimes numbered otherwise), which has been called the essence and glory of Magna Charta, runs thus: "No freeman shall be taken, or imprisoned, or disseized, or outlawed, or banished, or anyways injured, *nor will we pass upon him, nor send upon him*, unless by the legal judgment of his peers or by the law of the land." The phrase which we put in italics is an exact translation of *nec super eum ibimus, nec super mittimus*; but it has been much disputed what this means. Coke's opinion seems on the whole to be the best, and is that adopted by Bowen; it is, that no man shall be condemned in the court of king's bench, where the king is supposed to be present, nor before any commissioner or judge whom the king may depute or delegate to try him. The meaning of some other passages is equally obscure; but it is made so only by the lapse of time, and the disuse of phraseology once well understood. For the searching and thorough protection of right and suppression of all wrong afforded by the provisions of this remarkable instrument, and the singular force and precision of much of the language used, prove that those mailed barons had men among them, or at their call, who could employ in their service all the resources of the best cultivated intellects. It was regarded at the time as of so

great importance, that the barons compelled the king to put into their possession the city and tower of London, to be held by them for a certain time as a pledge for the due observance of the charter. They also required him to consent that 25 of their number should be chosen as "guardians of the liberties of the realm," with power to make war upon the king if he should violate the charter. In the subsequent reigns it was repeatedly confirmed, the sovereigns of England finding that when they were in peril and their subjects disposed to resist them, they could do nothing so popular as make a solemn confirmation of the "Charter of Liberties." This circumstance, and the traditional reverence for Magna Charta, together with its actual value, have caused some mistakes concerning it. The nobles who procured it are often called the patriots of their age, and are believed to have contended for the rights of the people. This is not quite true. Every thing in the charter itself, and whatever is related concerning it in contemporaneous history, lead to the conclusion that the purpose of those who formed it was mainly to preserve the rights and privileges of their own order; and the provisions for the security of merchants, and of freemen generally, while dictated probably by some desire to secure their rights, was the readiest way to obtain that coöperation of various interests which was necessary to insure success. In the 18th century the villeins or serfs were probably the majority of the inhabitants of England; but the word villein occurs in Magna Charta but once. In the 24th section it is declared that if a freeman be amerced for crime, it shall be "saving his curtenement," by which word is meant the means of his livelihood, as the tools of a mechanic or the like; and a merchant "saving his merchandise;" and (in the next section) a villein "saving his wainage," and while these (his plough, wagons, and cattle) were certainly the tools of his trade, it is, from the character of the whole instrument, and of the times in which it was made, a not unreasonable inference that this single precaution for the benefit of the villein was at least recommended by the fact, that it preserved to him those implements without which he would be of little use to his lord. In truth, Magna Charta was intended mainly for the nobles and landholders of England; but it embraced in its terms all freemen. It was admirably contrived, and never lost its force; and as, in succeeding ages, villeinage gradually disappeared, and the serfs rose into the condition of freemen, they rose also into the protection and came within the benefit of Magna Charta. Hence there was a constantly increasing class who looked up to it with reverence and with confidence. Its force was never lost by disuse, and its principles were never forgotten. It made the habeas corpus act and similar securities for personal rights and liberties possible; and in this way it may deserve the epithet which Mr. Hallam uses, when he calls it "the keystone of English liber-

ty."—The general provisions of Magna Charta may be stated briefly. It confirmed the liberties of the church, and redressed some grievances incidental to feudal tenures. It prohibited unlawful amercements, distresses, or punishments, and restrained the royal prerogative of purveyance and preëmption. It regulated forfeiture of lands, and prevented the grant of exclusive fisheries, or of new bridges injurious to a neighborhood. It established, or at least founded, the right of the owner of personal property to dispose of it by will, and it put the law of dower on the footing on which it has ever since stood. It protected merchants, required uniformity of weights and measures, and forbade alienation of lands in mortmain. It guarded against delays and denials of justice, and brought the trial of issues within reach of all the freemen by means of assizes and circuits; and it asserted and confirmed those liberties of the city of London, and all other cities, boroughs, towns, and parts of the kingdom, from which, as from so many centres, political freedom afterward spread through the land. And in the sections already particularly alluded to, it protected every freeman from loss of life, liberty, or property, except by the judgment of his peers or the law of the land. In one brief section (the 46th), which we should select as that which manifests at once the greatest wisdom and the widest humanity, it declares: "We will sell to no man, we will not deny or delay to any man, right or justice."

MAGNA GRÆCIA, the collective name of the ancient Greek cities and districts in southern Italy (according to Strabo, also of those in Sicily), applied chiefly to the cities on the Tarentine gulf (Tarentum, Sybaris, Croton, Metapontum, Locris, Rhegium, &c.), and on the western coast (Cumæ, Neapolis, &c.). Improperly the name is used also of the whole south of Italy, including especially the provinces of Apulia, Calabria, Lucania, and Bruttium, and not alone of the Grecian settlements. The origin of the name is doubtful. The Greek *ἡ μεγάλη Ἑλλάς* seems to be a translation of the Latin name.

MAGNAN, BERNARD PIERRE, a French marshal, born in Paris, Oct. 7, 1791. He studied law, but at the age of 18 enlisted in the 66th regiment of the line, and was engaged in the campaigns of Portugal and of Spain. He became sub-lieutenant in 1811 and captain in 1818, and gained a high reputation for bravery at the sieges of Ciudad Rodrigo and Almeida, as well as in the battles of Busaco, Fuentes d'Onoro, Arapiles, and Vittoria. Being transferred to the imperial guard, he served with it until the capitulation of Paris. In 1816 he was received in the royal guard, and in 1823 fought as lieutenant-colonel in the Spanish campaign. In 1827 he was promoted to a colonelcy, in 1830 distinguished himself in Algeria, and was after his return made commander of the legion of honor. In 1831 an insurrection broke out among the workmen of Lyons, which he was ordered to suppress. Instead of firing on the insurgents,

he opened a parley with them, and was for this suspended. He then entered the Belgian army, and received the rank of general of brigade (1832). In 1839, when there was danger of a war with Holland, he commanded at Beverloo 25,000 men. Peace having been signed between the two countries, he returned to France, where he had held since 1835 the rank of *maréchal de camp*. After being stationed for a short time in the Pyrénées, he obtained command of a division in the department of Nord, which he held for 7 years, during which time he was several times called on to suppress insurrections among the workmen of Lille and of Roubaix. In 1840, having been accused of complicity in Louis Napoleon's attack on Boulogne, and of having honors promised him in case of success, he defended himself against the charge before the chamber of peers. He became lieutenant-general in 1845, and on the revolution of Feb. 1848, he offered his services to Louis Philippe, who declined them. He however remained at the Tuileries with the duke de Nemours, and is said to have been the only general officer in uniform who accompanied the duchess of Orleans and her children to the chamber of deputies. Under the provisional government he was placed in command of the 8d division of the army of the Alps. During the insurrection of June he advanced to the relief of Paris, marching 120 leagues in 7 days. He was soon after ordered by Marshal Bugeaud to suppress a popular movement at Lyons. Permitting the insurrection to organize, he led the troops in person to the attack, and, after a desperate conflict of 6 hours, was triumphant. For this he received the cordon of a grand officer of the legion of honor, and was promoted to command the division of Strasbourg. In July, 1849, he was elected from the department of the Seine to the legislative assembly. He however took but little part in the sittings, being prevented by military duty on the frontiers, and afterward by the command in chief of the army of Paris, to which he was appointed July 15, 1851. He rendered important aid to Louis Napoleon during his rise to power, was one of the few who organized with the prince president the *coup d'état*, and fought under Gen. St. Arnaud on Dec. 2, 3, and 4, 1851. He was retained in the command of the army of Paris, which he still holds, was promoted to the rank of marshal, and in 1852 was made a senator, and in 1854 grand huntsman to Napoleon III.

MAGNE, PIERRE, a French statesman, born in Périgueux in 1806. He studied law in Paris, practised for some time in his native place, and between 1843 and 1848 was a member of the chamber of deputies. During this interval, having attracted the attention of Marshal Bugeaud by some able reports on Algerian affairs, he was appointed secretary of the committee on the budget, and subsequently minister of the department of Algeria established by Guizot. In 1849 he was appointed under secretary of finance, in 1851 minister of public works, in

which capacity he showed great industry and ability, and in 1854 minister of finances, a position which he still occupies.

MAGNENTIUS, FLAVIUS POPILIUS, Roman emperor of the West, of German birth, died in Aug. 353. He rose under Constantine from the rank of a private soldier to that of count. Having been intrusted by Constans with the command of the Jovian and Herculan battalions, which had been substituted for the ancient prætorian guards at the remodelling of the empire by Diocletian, he availed himself of his office to plot the emperor's overthrow. On Jan. 18, 350, presenting himself in imperial robes at a great banquet given by one of the conspirators at Autun, he was immediately saluted with the title of Augustus; and assassins sent for the purpose having despatched Constans, Magnentius was acknowledged as emperor by all the western provinces except Illyria. Constantius, on hearing of his brother's murder, hastened from the confines of Persia and defeated Magnentius at Mursa on the Drave in 351, and in the passes of the Cottian Alps in 353. These disasters led to the defection of all the countries that had recognized the usurper, who thereupon committed suicide.

MAGNESIA, the oxide of the metal magnesium, one of the alkaline earths, the compound character of which was discovered by Davy. It consists of one equivalent of magnesium (Mg)=12, and one of oxygen (O)=8, or 60 per cent. of magnesium and 40 of oxygen. Like lime, it is found in nature combined with carbonic acid, which may be expelled by calcination at a red heat. Thus obtained, it is a fine, light, white powder, having neither taste nor smell, almost insoluble in boiling, but less so in cold water, of specific gravity 2.3, and known as calcined magnesia. It was regarded as infusible until melted by Dr. Hare with his compound blowpipe. Its properties are alkaline, and it neutralizes all acids. In pharmacy it is prepared from the carbonate to be administered as an antacid and laxative. It is useful in dyspepsia and sick headache caused by acidity of stomach and constipation; it is sometimes preferred to the carbonate on account of the smaller dose required, as well as the absence of carbonic acid gas in its composition. In calculous complaints it is beneficial by diminishing the product of uric acid. As a laxative its mild action as well as its other properties renders it a favorite medicine for children and infants. The freshly precipitated hydrate is recommended as an antidote to arsenic.—The carbonate of magnesia is also largely employed in medicine. It exists in the magnesian limestones (see *DOLOMITE*), and forms the mineral species magnesite. From these it may be obtained, but the sources that chiefly furnish it are the sulphate of magnesia (see *EPSOM SALT*) of mineral springs, or this salt mixed with chloride of magnesium supplied by the bittern of salt works. It is thus manufactured in New England. In Baltimore and Philadelphia the sulphate is obtained from

a silicious hydrate of magnesia found in the serpentine rocks of that region. Most of the carbonate used in this country is imported from Scotland, and is of the kind called light magnesia. It is prepared by mixing together dilute solutions of sulphate of magnesia and carbonate of soda, with or without heating. An interchange of acids and bases takes place, and an insoluble carbonate of magnesia is precipitated, which may be washed with hot water, collected, and dried. For heavy magnesia a cold saturated solution of carbonate of soda is added to an equal volume of boiling saturated solution of sulphate of magnesia, and 8 volumes of water. The mixture is boiled till effervescence has ceased, and then more boiling water is added, the whole being continually stirred. This variety is granular, while the light is more or less intermixed with prismatic crystals. The light cubes of magnesia are prepared by removing the precipitate after it has drained for one or two days in linen strainers to cubical moulds open at the bottom, and standing in a warm room upon a table of plaster or porous stone, which absorbs the water. After a time the moulds are turned over, so as to present another side to the absorbent surface. Carbonate of magnesia resembles the calcined in its appearance and qualities; it is somewhat more soluble in cold and in hot water, but still requires to dissolve it 9,000 parts of the latter and 2,493 of the former. It contains some water in its composition, but the proportions of its ingredients vary with the methods of its preparation. Phillips found that 4 equivalents of the carbonate were combined with one of the bihydrate and 4 of water. In medicine it is used very much for the same objects as the calcined magnesia. When decomposed by the acids in the stomach, the new compounds of magnesia found are usually cathartic. Such are produced by following it with draughts of lemonade. Various other compounds of magnesia, as the citrate, tartrate, and sulphate, are used in medicine; the first, which is prepared by treating the carbonate with citric acid, adding an excess of acid, impregnating with carbonic acid, and sweetening with sirup, has within the last 10 years come into extensive use as a cathartic, mild and cooling in its properties. Magnesia combined with sulphurous acid forms the sulphate recently found to be a very important disinfecting agent. (See *DISINFECTANTS*.) Magnesia in combination with silica enters largely into the composition of many rocks and minerals, such as serpentine, steatite or soapstone, asbestos, &c.

MAGNESIA. I. The most easterly division of ancient Thessaly, Greece, a narrow and mountainous strip of land, containing among others Mts. Ossa and Pelion, and bounded N. by the lower course of the Peneus, on the confines of the Macedonian district of Pieria, E. and S. E. by the Ægean, S. W. by the Pagassan gulf, and W. by the great Thessalian plain. II. The name of two cities of Lydia, Asia Minor. One was situated on the S. bank of the Hermus, and

celebrated by the great victory of the Romans over Antiochus the Great of Syria (190 B. C.), which made the conquerors masters of a part of Asia Minor. The other was situated on the river Lethæus in the valley of the Mæander, and had a celebrated temple of Diana, the ruins of which are still visible. It was one of the towns given by the king of Persia, Artaxerxes, to his guest the exiled Themistocles.

MAGNESIUM, the metallic base of magnesia; symbol, Mg.; chemical equivalent, 12; specific gravity various, given from 1.7 to 2.24; hardness that of calcareous spar. Davy proved its existence; but Bussey in 1880 first obtained it in sufficient quantity to test its properties. He decomposed the chloride of magnesium by transmitting through it when heated the vapors of potassium. The metal resembles silver in appearance; it is malleable, ductile, and fuses at a dull red heat. It does not change under water or in dry air, but in damp air it soon oxidizes. It consumes with a brilliant white flame when heated to redness, or when thrown into hydrochloric acid. It burns brilliantly in chlorine or in the vapors of bromine, iodine, sulphur, &c. It has recently been proposed by M. Bunsen of Paris to employ this metal in the form of fine wire for illuminating purposes. He finds that it may be lighted by the flame of an alcohol lamp, and in burning gives a perfectly steady and very intense light. A wire $\frac{1}{16}$ of an inch in diameter burns at the rate of about 8 feet in a minute, and gives a light equal to that of 74 stearine candles of 5 to the pound. The weight of such a wire 8 feet long is about 2 grains. M. Bunsen proposes to have the wire wound upon bobbins and furnish it at a regular rate to the lamp. Should the metal be procurable at a considerably reduced cost, as may very likely follow an increased demand for it, it may then prove an excellent method of furnishing light for domestic purposes, and more particularly for lighthouses and uses requiring a great intensity of light. Even at its present cost it may be advantageously used for photographing in places inaccessible to the light of day. For this application it is especially adapted by reason of the extraordinary power of the photochemical property of its light.

MAGNETISM. If a bar of slightly tempered steel be held vertically and struck several blows with a wooden mallet, it will acquire the property of attracting iron filings at its two extremities. This property was first observed in specimens of an oxide of iron found near Magnesia, a city of Lydia in Asia Minor, and hence the name magnetism has been applied to the phenomena to which it pertains. The same property may be communicated from one bar of steel to any number of similar bars, by rubbing one half of the length of each of the latter with the end of the former which was toward the earth in the experiment above mentioned, and the remaining half with the other end of the same bar. In this process a remarkable fact becomes evident, namely, that the bar which is employed

to impart the magnetic property loses none of its own power; on the contrary, if the process is properly performed, it will become stronger; and hence we deduce the conclusion, that in magnetization there is no transfer of any substance from one body to another, but the development of a latent principle. If a magnetized bar be suspended by a fibre of untwisted silk, in such a manner as to have perfect freedom of motion, it will assume a N. and S. direction; that is, it will exhibit the phenomena called polarity. If to either end of a magnetized bar thus suspended a piece of soft iron be approached, attraction will be exhibited between them; when a similar bar is rolled in iron filings, the latter will be found to adhere in thick clusters at the two ends or poles, while none will attach themselves to the middle of the bar. If, instead of presenting to the suspended magnet pieces of soft iron, we bring near to its two ends in succession the two poles of another magnetized bar, repulsion as well as attraction will be exhibited; and by an attentive study of the phenomena we shall find that similarly magnetized ends repel, and dissimilarly magnetized ends attract each other. These forces act at great distances, through all interposed bodies, and like gravitation diminish in intensity with the square of the distance from each pole. If a number of bars of soft iron be placed near each other in the same straight line, and the N. end, for example, of a strongly magnetized steel bar be brought near one end of the series, each piece of iron will become magnetic and exhibit polarity. The near end of the first magnet will be a S. pole, the far end a N. pole, and so on throughout the series, as follows:

S. N. S. N. S. N. S. N. S. N. S. N. S. N.

When the magnet is removed, the polarity of the iron bars ceases; and when the pole of the developing magnet is reversed, the polarity of the whole series is also reversed. The development of magnetism in this way is called induction, and by it we are enabled to explain many facts which would be otherwise perplexing. In accordance with this principle, we can assert that a magnet does not attract soft iron in its natural state, but that it first renders the metal magnetic, and then the attraction takes place between the dissimilar poles of two magnets. Again, when we sprinkle iron filings on a paper placed over a magnetic bar, they arrange themselves in beautiful curves radiating from each pole and joining near the equator of the bar. These lines are sometimes called (we think improperly) lines of magnetic force; they merely result from the fact that each particle of iron becomes by induction a separate magnet, and attracts the adjacent filings, their arrangement in this case being the same as that of a series of small needles when under the influence of the two poles of a magnetic bar. The induction takes place readily in soft iron, but disappears as soon as the inducing magnet is removed, but not so with hardened steel; though the effect

is less powerful in this, the polarity is permanent. The method of making steel magnets of great power, which we have found from long experience the simplest and most efficient, is as follows: Procure say 10 flat bars of good steel bent into the usual form of a horse shoe; let these be well hardened and fitted with their flat sides together so as to form a compound magnet. Each of the members of this bundle may be magnetized separately to a small degree by supporting one of the legs on the lower end of a long rod of iron held nearly perpendicular in this latitude, and the other leg on the upper end of the same rod; or by rubbing one leg with the N. pole of a magnetized bar and the other with the S. pole. The several shoes, or bars, being in this way feebly magnetized, 8 of them are joined together with their similar poles in contact, forming a compound magnet with which the remaining 2 bars are to be magnetized to a higher degree. For this purpose the latter are placed on a table on their flat sides, the N. pole of the one in contact with the S. pole of the other, so as to form a closed circuit; on any part of this circuit the compound horse shoe is placed perpendicular to the plane of the table, with its N. pole in the direction of the S. pole of the bar or shoe on which it rests, and then caused to slide in either direction entirely around the circuit, care being taken to retain its perpendicularity. After having gone over the surface of the 2 shoes in this way several times, they are turned over without separating their ends, and the process repeated on the side which was previously under. By this method the 2 bars will receive a magnetic power nearly equal to the sum of the powers of the 8 magnets in the bundle. Next these 2 bars are placed in the bundle, and 2 others are taken out and subjected to the same process. These in turn are put into the bundle, and 2 others are taken out and rubbed in the same way, until each pair of bars has been gone over 2 or 3 times in succession. By this method, with the most feeble beginning, the magnetism of the several shoes may be developed to their full capacity, and a magnetic battery produced of great power. A compound horse shoe of this kind is the most convenient instrument for magnetizing straight bars of hardened steel for practical uses. Suppose, for example, we wish to magnetize 4 bars, each 16 inches long, an inch wide, and $\frac{1}{4}$ of an inch thick; these are placed on their flat sides in the form of a rectangular parallelogram with their ends in contact; the compound horse shoe is then placed perpendicularly on the middle of one of the bars, and slid entirely around the parallelogram several times in succession; each bar is then turned over in its place so as to bring its lower side upward, and the process repeated, care being taken to keep the horse shoe perpendicular to the plane of the parallelogram and in the same relative positions of its poles to those of the bars. By this method, if the compound horse shoe is suffi-

ciently powerful, the 4 bars can be magnetized to saturation in the course of a few minutes. If there are but 2 bars to be magnetized, the parallelogram is completed by joining the ends of these with 2 similar bars of soft iron, and the same process of rubbing performed as before. We have seen, in the article **ELECTRO-MAGNETISM**, that the most powerful magnetic induction is produced in soft iron by transmitting around a bar of this metal a current of galvanism, and that temporary magnets of great power can be produced in this way. The same method affords the readiest means of strongly magnetizing steel bars. Whatever may be the nature of the change which takes place in iron at the moment of magnetization, we are certain that it pertains to the atoms or molecules of the body, and not to the assemblage of these as a whole. To be convinced of this, it is only necessary to magnetize a steel rod, for example a thick knitting needle, the polarity of which will be exhibited near its two ends, while no attraction will be manifested near the middle. If however we break this into two pieces, we shall find each half is a perfect magnet; the separated ends which were previously joined together in the middle of the whole length will now exhibit polarity. If each of these pieces be again broken in two, we shall have four perfect magnets; and however frequent the division or small the parts into which the needle is divided, each part will still exhibit a N. and S. pole. We may continue, at least in thought, this division, and we have no reason to doubt that however far it might be carried, the same result would be produced. We infer from this experiment that the reason why the middle of a bar exhibits no magnetism is not that none really exists there, but that it is neutralized by opposite polarities. We are also certain that magnetization is attended with at least a momentary motion of the atoms of the iron. This is proved by the fact that during the sudden magnetization of a bar of iron, by means of a current of electricity transmitted through a spiral conductor enclosing the bar, a sound is emitted; and if the bar be rapidly magnetized and demagnetized by an interruption of the current, a musical sound will be produced. This fact was first noted by Dr. Page of the United States, and subsequently experimented upon by De la Rive, Becquerel, and others in Europe. The fact that a change takes place in the molecules is also rendered evident by an experiment of Mr. Jule of Manchester, England, in which he found that, although the whole capacity of the iron bar did not change on being magnetized, yet its dimensions varied, its length being increased and its width correspondingly diminished. Again, in the magnetization of iron, it is found that time is required to produce a full effect, as if it were necessary that inertia should be overcome; and Mr. Grove has shown that, in rapidly changing the polarity of a bar by means of an alternating current of electricity, the iron increases in temperature. Dr. Maggic

of Verona asserts that a circular plate of homogeneous iron, when magnetized, conducts heat better in a direction perpendicular to the line joining the poles than in the direction of this line itself. It is also stated that iron strongly magnetized resists the action of the file in a greater degree than in its ordinary state.—It was formerly supposed that magnetism could be developed only in iron, nickel, and cobalt; but we now know from the researches of Faraday, that all bodies exhibit signs of an inductive influence, provided the magnetic power applied be sufficiently great. From the results of his experiments, Faraday was led to divide all bodies into two great classes; those like iron, nickel, and cobalt, which, on being suspended between the poles of an electro-magnet, assume an axial direction, were denominated magnetic bodies, or paramagnetic; while those which arrange themselves at right angles to the magnetic meridian were denominated diamagnetic. (See DIAMAGNETISM.) The following series exhibits some of the last results obtained by Faraday on the magnetic and diamagnetic powers of bodies, in which the angle of torsion necessary to balance the force of a magnet expresses the power of the various substances, volume for volume, + representing the paramagnetic bodies, and — the diamagnetic: proto-ammoniate of copper, +184.28°; oxygen, +17.5°; air, +8.4°; nitrogen, +0.8°; carbonic acid gas, 0.0°; hydrogen, —0.1°; glass, —18.2°; pure zinc, —74.6°; alcohol, —78.7°; wax, —86.73°; nitric acid, —87.96°; water, —96.6°; sulphuric acid, —104.47°; sulphur, —118.°; bismuth, —1967.6°. Faraday discovered another remarkable evidence of the action of magnetism on liquids and solids, as manifest in the effect produced on a polarized beam of light. Let a piece of gas pipe 18 inches long be closed at each end with a plate of tourmaline and filled with water. Let the axes of the tourmalines be placed transversely so that the polarized beam of light which passes through the first may not be transmitted through the second. If while the apparatus is in this condition the iron be magnetized by a current of electricity passing through a long wire helix surrounding the tube, the beam of light will be partially transmitted by the second tourmaline. It is evident from this result that the magnetization of the iron has produced an effect on the particles of the liquid, which has enabled them to react on the polarized beam of light and to produce as it were a twist in its plane of polarization. A similar result will be produced if the liquid be contained in a tube of glass or any other substance, and placed between the poles of a powerful magnet. To observe the effect however in this case, the poles of the magnet should be perforated for the transmission of the light. A similar effect is produced upon solid transparent bodies, and particularly upon heavy glass of the silicio-borate of lead. Faraday also discovered the fact that crystallization exerts a considerable influence upon the direction of

crystallized bodies placed between the poles of a powerful electro-magnet; Plucker found that the axis of crystallization tended to assume the axial or equatorial direction; and Tyndall of London and Knoblauch of Germany established the fact that if the molecules of any body are more condensed in one direction than in any other, the magnetism will act along this direction with greatest intensity. If the substance is paramagnetic, the line of greatest condensation will assume an axial position; if diamagnetic, the same line will come into a state of rest in the equator. This is shown by mixing carbonate of iron with gum into a stiff paste, a disk of which being compressed between the fingers, so as to give a greater density in one direction, and afterward suspended between the poles of a powerful electro-magnet, will settle with its line of greatest condensation in the axial direction. If a similar experiment be made with a compound of powdered bismuth and gum, the line of greatest condensation of this factitious substance will assume an equatorial position.—Various attempts have been made to show a direct magnetizing influence in the solar beam to develop magnetism in soft iron needles, and it has even been asserted that the direct radiation from the moon has a powerful disturbing effect upon the needle of the mariner's compass; but the most delicate experiments made by those best qualified for such investigations have failed to exhibit any result of this kind.

MAGNETISM, ANIMAL. See **ANIMAL MAGNETISM.**

MAGNETISM, TERRESTRIAL. The study of terrestrial magnetism is without doubt one of the most useful and important branches of physical geography; the service which it has rendered to civilization and commerce can scarcely be too highly estimated. Aware of its importance, almost every enlightened government has given attention to the subject, and in some cases large sums have been expended in its prosecution. Gilbert in 1600 was the first to announce the bold hypothesis that the earth is a great magnet, and that the needle assumes a N. and S. direction because it is attracted by the dissimilar and repelled by the similar poles of the terrestrial sphere. He illustrated this hypothesis by magnetizing small globes of steel; but this illustration, though it served in a general way to represent the phenomena, is not strictly correct. In the first place, the magnetism of the earth is not symmetrical like that of a steel magnet, but is to a considerable degree irregular; and secondly, it is not permanent, but subject within certain limits to almost continual changes both in direction and intensity. Indeed, the magnetic needle is scarcely ever absolutely stationary from one moment to another, but is constantly exhibiting minute variations. If the earth is a magnet, the free needle at any place should assume a definite direction; but it does not follow from the hypothesis that this direction must be the true north and south, since the magnetic poles of the earth do not necessarily

coincide with its geographical poles. If the two poles be in the same meridian with a given place, the needle will at that place point to the true north; but if the magnetic pole lie either W. or E. of the meridian of a given place, the N. end of the needle will deviate either E. or W. of the true north, and the phenomenon of the declination or variation of the compass will be exhibited. That the needle does not point to the true north in all portions of the earth was observed by Columbus in his first voyage of discovery, and thousands of observations have since been made to obtain the data for constructing charts to represent for the use of the mariner the declination in various parts of the earth. Again, if we assume that the earth is a great magnet, it will follow that in passing from the magnetic equator, the needle which is accurately balanced, so as to settle horizontally at the former place, will incline or dip as we advance to either pole. That this is really the fact was first discovered by Robert Norman in 1576. Furthermore, if the earth is a magnet, we should expect that the magnetic intensity or the strength of the action would not be the same at all points of its surface, and this inference has also been found to be true. By counting the vibrations of a delicate dipping needle, we find that the strength of the magnetism of the globe increases as we go from the equator toward the pole. The magnetic intensity, however, exhibited by observations of this kind, does not indicate as rapid an increase of force as we approach the magnetic pole as might be expected from such a distribution of magnetism as would result from a magnetized sphere of iron. In conformity with the three magnetic elements we have mentioned, namely, the variation, the dip, and the intensity, it is customary to represent the magnetic condition of the earth at a given time by three systems of lines supposed to be drawn on the surface of the globe. These are as follows: 1, the line drawn through all places where the needle points to the true north or south, to 5° W., to 5° E., 10° W. and 10° E., and so on, called the isogonic lines, or lines of equal variation or declination; 2, lines nearly at right angles to the former, drawn through all places exhibiting the same angle of dip of the needle, called isoclinical lines; and 3, a system of E. and W. lines joining all places having the same magnetic intensity, and consequently known by the name of isodynamic lines. It is a problem of much practical importance in regard to the art of navigation, as well as to the study of the phenomena of terrestrial magnetism, that these three systems of lines should be accurately determined; and accordingly expeditions have been fitted out by different nations almost expressly for this purpose. All the observations, however, which have been made in regard to them, indicate the fact that they are not permanent, but are constantly undergoing a change, of which the law is exceedingly complex. Halley's chart of declination for 1800 is very different from that of Barlow for 1838; and Hansteen's dip chart for

1780 does not represent the isoclinical lines of the present day. The great practical object then of investigation in this branch of science, is to discover the law of these changes, in order that, the position and form of these lines being determined for a given epoch, they may be calculated for any future time. Our limits will not permit us to give a full history of all the attempts which have been made to solve the problem of terrestrial magnetism, or of the various hypotheses which have been invented to represent approximately the distribution and changes of the magnetic force of the earth; we must therefore confine ourselves to the more prominent. The phenomena were first referred to a very small magnet at the centre of the earth, the direction of which is subject to irregular changes. Tobias Mayer, instead of supposing a magnet to be placed at the centre of the earth, conceived one to be situated at about the 7th part of the earth's radius from the centre, and from this hypothesis he was enabled to calculate the variation and dip in places not far distant from those in which these quantities had been determined by actual observation. Hansteen of Norway, to whom the world is indebted for collecting an immense number of observations, endeavored to represent the phenomena by the hypothesis of two small eccentric magnets of unequal strength placed at the centre of the earth, giving rise to 4 magnetic poles, 2 in each hemisphere. In order to represent the variations of the needle, the poles of each of these two magnets were supposed to perform a revolution around an intermediate line, with different velocities. We owe to the celebrated Gauss of Göttingen, however, the first rigid investigation of the problem in accordance with a definite plan. He founded his research on the assumption that the terrestrial magnetic force, or that which is exerted on a needle freely suspended by its centre of gravity, is the resultant action of all the magnetized particles of the earth's mass. According to this assumption, the governing power which affects the needle is due to the magnetism of the earth itself, while the different perturbations to which the needle is subjected are the results of extraneous forces. To give clearness of perception, he represents magnetization as consisting in the separation of two magnetic fluids, giving magnetic polarity to each particle, or in other words to a repulsive and attractive force acting inversely as the square of the distance. No change would be produced in the result by adopting the hypothesis of Ampère, in which magnetism is held to consist of constant magnetic currents; nor would there be any difference if terrestrial magnetism were ascribed to a mixed origin, as consisting partly of actual electrical currents and partly of permanently magnetized masses. Starting from these assumptions, Gauss obtained a general mathematical expression for the action of the whole globe on a magnetic needle, however irregular might be the distribution of the magnetism of the former. In other words, he obtained an ex-

pression by which, if the distribution of the magnetism of the earth were known, and the intensity of its action ascertained with reference to a unit of distance and intensity, the position of the needle and the magnetic force by which it was acted upon at any point could be determined; and conversely, if the action of the earth on the needle were known for a large number of places on the surface of the earth, the distribution of the magnetism might be considered the unknown quantity, and might be approximately found from the data thus afforded by observation. In this way Gauss has been enabled to give a method of constructing general charts to represent in every part of the earth the magnetic declination, inclination, and isodynamic lines, the intensity and direction of the magnetic force being known at a given number of places. The data necessary for improved charts of this kind have been furnished by the magnetic surveys made in various parts of the world, within the last quarter of a century, at the suggestion and principally under the direction of the British association. By repeating the construction of such charts for different epochs, the secular changes in different parts of the earth will become known; and it is hoped that, in due time, if the system of magnetic observations which has been established should be continued, the law of the changes will ultimately be fully ascertained. The investigations of Gauss have shown that the hypothesis of two movable magnets at the centre of the earth does not explain the phenomena of terrestrial magnetism. He defines a magnetic pole to be the place at which the needle points directly downward, or at which the dip is 90° . Indeed, he has pointed out the very obvious fact, that if there be two such points in the northern hemisphere, then there must be somewhere between the two a third point at which the needle would also assume the vertical position. Gauss, however, arrives at the remarkable conclusion that the place of greatest magnetic intensity does not coincide with that which is usually denominated the pole; and it would appear that there may be a diffused space in the northern hemisphere around which the isodynamic lines may be drawn, representing apparently at least two centres of greater magnetic attraction. These phenomena are best represented by the hypothesis of magnetism due to currents of electricity in the earth, but as yet no definite hypothesis has been advanced as to the nature of such currents. It is true, they have been referred to thermo-electricity; but how the varying heat of the sun or the high temperature of the interior can give rise to currents constantly circulating round the earth, of such intensity and such flexures as would account for the observed direction and intensity of terrestrial magnetism, has not yet even approximately been made out. The latest general charts which have been constructed from a combination of actual observation and theoretical deduction are by Gen. Sabine and Mr. Evans of England, and Dr. Gold-

schmidt of Germany. According to these there are but two magnetic poles, one in each hemisphere. Dr. Goldschmidt places the northern pole in lat. $78^\circ 35' N.$ and long. $95^\circ 39' W.$; the southern in lat. $72^\circ 35' S.$ and long. $152^\circ 30' E.$ The position assigned by Evans for the northern pole is slightly different; he places it for the year 1858 in lat. $70^\circ N.$ and long. $98^\circ W.$ of Greenwich. The positions of the southern poles have not been determined with certainty. From the same authority there are four places of greater magnetic intensity—one in North America in lat. $52^\circ 19' N.$ and long. $92^\circ W.$; another in Siberia in lat. $70^\circ N.$ and long. $120^\circ E.$ The position of the southern places of greater magnetic power have not been definitely ascertained. Some facts relative to the lines of variation on the North American continent are given in the article COMPASS; and a more definite and scientific account of the very important contributions of the U. S. coast survey is contained in the article under that title, which under its able superintendent, collateral to its great object, is constantly furnishing important additions to our knowledge of the physics of the globe. Prof. Bache, director of the coast survey, has given particular attention to the subject of the distribution of magnetism within the territory of the United States. With the assistance of Mr. Hilgard and Mr. Schott he has collected and discussed the observations of Col. Lefroy in Canada, of the late Professors Keeley and Locke, of Professors Loomis and Bond, Major Emory, Capt. Whipple, Lieut. Ives, Dr. Kane, and those of the coast survey itself, which up to the present time have been made at upward of 200 separate stations. Under the direction of Professor Bache, Mr. Schott has also prepared a set of tables for practical use, giving the secular changes of the magnetic declination for the principal cities in the eastern part of the United States. (See the "American Journal of Science," vol. xxiv., and also vol. xxix., second series.)—What we have said in regard to the magnetism of the earth principally relates to its state at a particular time. We shall now briefly give an account of the discoveries which have been made in regard to the changes to which terrestrial magnetism is subjected; and for the data from which these have been deduced science is indebted to the several magnetic observatories established in different parts of the earth. These are furnished with improved instruments, which in their present perfect state constantly record, by means of photography, the minutest changes in intensity and direction of the magnetic force. The magnetic perturbations were at first supposed to consist of two classes, namely, periodical and fitful; the latter, however, are now known to recur at regular periods, and are therefore not properly designated by this term. The changes of terrestrial magnetism are of three classes. The first consists in a movement of the centres of the magnetic force in geographical space, from W. to E. in

the northern hemisphere, and from E. to W. in the southern. It is to this motion that the change denominated secular is ascribed, and to which is referred the variations from year to year in the positions of the magnetic lines. Although the variations of the needle at a given place may appear to be very irregular, yet from a comparison of those in all parts of the earth it is found that the motion of the system of forces which produces these changes has been uniform, or nearly so, during the last 2 or 3 centuries. The cause of this change is at present entirely unknown; it has no analogy with any other class of physical phenomena with which we are acquainted. By a rough comparison of the isothermal lines and the lines of equal magnetic intensity, a general similarity has been observed, and hence the two have been considered as referable to the same cause; but it will be perceived that this analogy does not hold, since the magnetic lines are in constant motion, while the isothermal lines retain very nearly a fixed position, or at least change in comparison with the other lines with extreme slowness. The second system of changes has evident relation to the annual position of the earth in its orbit round the sun, and its revolution on its axis. These were at first ascribed to the influence of the heat of the sun on different parts of the earth; but they have the remarkable characteristic of exhibiting notably the same amount in the southern hemisphere as in the northern, and in the tropical as in the temperate zones. The magnetic force is found to be greater in the months of December, January, and February, when the sun is nearest to the earth, than in those of May, June, and July, when it is most distant from it; whereas, were the effect due to temperature, the two hemispheres would be oppositely instead of similarly affected in each of these two periods. We must therefore ascribe the effect to the direct magnetism of the sun itself, and consider it established that this luminary like the earth possesses attracting and repelling poles, and that the effects on the needle result from the different positions of the earth in regard to these centres of action. The pole of the needle which is least distant from the sun makes a double diurnal movement in the following manner. It arrives at its greatest western excursion 4 or 5 hours before the sun passes the meridian of the place, as if it were repelled; it then turns eastward with increasing celerity, and reaches the limit of its eastern excursion one or two hours after that passage. As the sun passes the inferior meridian, there is repeated in the night the same variation as that which took place in the day. To illustrate the action, let us suppose two globes, a larger and a smaller, placed upon the same plane, with their axes of revolution not precisely parallel to each other, as in the case of the earth and the sun; and let us further suppose that one globe is made to revolve round the other, the axis of the former being constantly parallel to itself. It is evident

that in one half of the orbit of the moving globe the northern poles will be inclined toward each other, while in the other half of the orbit the southern poles will be similarly inclined; and if we further suppose that the magnetic axis of the sun, as in the case of the earth, does not differ very much from the axis of rotation, we shall have an explanation of the effects observed in the records of the diurnal motions of the needle. The N. end of the needle, which is attracted by the N. pole of the earth, will be repelled by the N. pole of the sun, provided it has dissimilar magnetism to that of the earth, and consequently will decline from the sun; and as, on account of the revolution of the earth on its axis, this luminary appears on the E. of every place in the northern hemisphere in the morning and on the W. side in the afternoon, corresponding variations in the needle will be exhibited. In the other half of the year, for a similar reason, the S. end of the needle will be affected in an analogous but opposite manner. The strength of the magnetism of the earth will be increased by the nearer approach of the sun, in the same way that two magnets having their dissimilar poles opposite each other are increased or diminished in magnetic power by a diminution or decrease of distance. We are indebted for the interesting discovery of the polar action of the sun to Gen. Sabine of England, who has had charge of the reduction of all the magnetic observations of the English colonial observatories; and to Dr. Kriegl of Austria for another of the same character, which leads us to extend the principle of magnetism to the moon. It is found that there is a variation of each of the magnetic elements corresponding with the diurnal position of the moon in regard to the earth; but this resembles the tides in exhibiting two maxima and two minima in the course of 24 hours, regularly changing in time with the motion of the moon in her orbit around the earth. These phenomena indicate that the moon is not magnetic *per se*, that is, possessed of permanent magnetism, but its magnetic condition resembles that of soft iron developed by the continued but varying inductive influence on account of change of distance of the earth and the sun. That these changes in the magnetic elements cannot be due to heat in this case, must be evident, since the temperature of the moon is but little greater than that of celestial space. The third class of variations, which was formerly denominated fitful, is now known in a certain sense to be periodical. They were denominated by Humboldt magnetic storms, and were found by Arago to accompany the appearance of the aurora borealis. Although it is impossible to predict from our present knowledge the recurrence of individual cases of these great perturbations in the intensity and direction of the magnetism of the earth, yet they are known to increase in number and magnitude of action, within the period of a little more than 5 years, and gradually to diminish through nearly an equal period, the whole

cycle being completed in a little more than 10 years. The magnetic storms have been observed in the most distant parts of the earth, and no doubt can now exist as to their cosmical character. The lunar influence of which we have just spoken does not appear to participate in or be connected with this decennial inequality. The periodicity of these apparently fitful variations of magnetism was first pointed out by Gen. Sabine, and has since been established by the investigations of Prof. Lloyd of Ireland, Dr Lamont of Germany, and by those of Prof. Bache from the observations made under his direction at Girard college. But the most astonishing result in regard to this class of perturbations is that they coincide with the periodical recurrence of the maxima and minima of the spots on the sun. A German astronomer, M. Schwabe, has established, by nearly 30 years of unremitting daily observation, the periodicity of this phenomenon. He finds that the solar spots increase in magnitude for about $5\frac{1}{2}$ years, and diminish through an equal period, the cycle, as in the case of magnetic storms, being completed in about 11 years. The discovery of a connection of this remarkable kind gives to magnetism a high position in the scale of distinct natural forces, and assigns to it equally with gravitation a truly cosmical character. It is not impossible that the spots on the sun may be connected with the falling into its gaseous envelope of meteorites, and this suggestion is favored by a late observation of Mr. Carrington of England, in which a remarkable appearance was observed on the surface of the sun, analogous to that which would have been produced by an occurrence of the kind we have mentioned. If this suggestion should be found to be correct by future observations, it will afford an explanation of the periodicity of the spots, since we are assured of the fact that the recurrence of shooting stars in great numbers is governed by a cyclical law.—It is not intended by what has been stated to convey the idea that meteorological changes may not affect the position of the needle, and that even the magnetic condition of the atmosphere, according to the hypothesis of Faraday, may not produce appreciable results; but as yet the actions of these appear to neutralize each other, and to leave no definite record of their existence in the course of periods of considerable length. It is probable, however, that with the improved photometrical instruments and a more minute scrutiny of their records, the effects due to these causes will be shown. Since the agitation of the atoms of an iron bar is found to favor the development of magnetism by induction, it is not improbable that the magnetism of the earth may be disturbed during the continuance and shortly after the occurrence of an earthquake.

MAGNETO-ELECTRICITY. We have seen in the article ELECTRO-MAGNETISM that great magnetic power is developed by passing a current of galvanism around a bar of soft iron; and since in all cases a mechanical action is accom-

panied by an equal amount of reaction, it is reasonable to suppose that electricity ought to be evolved by magnetism. Various fruitless attempts were however made to obtain this result; the form in which the effect was to appear was unknown, and it was not until 1832 that Faraday succeeded in exhibiting currents of electricity in a wire by means of magnetic reaction. It has also been stated in the same article, that, in accordance with the theory of Ampère, all the mechanical properties of an ordinary magnet may be exhibited by currents of electricity transmitted through spiral conductors; and hence, in order to present the phenomena of this class in the simplest form, we shall begin with stating the fundamental facts of what is called electro-dynamic induction, or electricity induced by a galvanic current. 1. Let a portion of a copper wire be extended in a straight line horizontally, and the two ends at a distance be connected with a galvanometer so as to form a closed circuit in which a current may be indicated. Let also a portion of another wire, connected with a galvanic battery, be placed parallel to the first, and a current sent through it. If the wire transmitting the battery current be suddenly brought near the wire connected with the galvanometer, during the approach of the second wire toward the first a current of the natural electricity of the latter will pass through the galvanometer in a direction adverse to that of the inducing current. 2. The induced current continues only during the motion of the inducing conductor; when the motion of this is stopped, the induced current ceases, and while the current of the battery remains stationary and continues the same in quantity and intensity, no perceptible effect is exhibited in the adjoining wire. 3. When the inducing current is suddenly moved away from the first wire, a current is observed to pass through the galvanometer in the opposite direction to the former induced current, or in the same direction as the battery current. 4. Let the two wires be placed parallel and near to each other, while the circuit of the battery current is interrupted. If in this condition the current from the battery be suddenly established through the inducing conductor, an induced current of electricity will pass through the galvanometer in a direction adverse to that of the battery current; or in other words, the effect will be the same as that of the approach of the battery current to the inducing wire, as in case 1. 5. During the continuance of the battery current of unimpaired strength and intensity, no disturbance of the natural electricity of the adjoining wire is perceived; but at the moment the current of the battery is stopped by a rupture of the circuit, a current passes through the galvanometer in the same direction as that of the current of the battery. All these phenomena are in accordance with the hypothesis that during the transmission of a current of electricity through a wire, there is exerted in space on every side an inductive action diminishing with

the distance which disturbs the natural electricity of any conducting matter which may be brought within its influence; that while the conductor remains at rest within this influence an abnormal equilibrium exists; and when the conductor is removed from this influence, or when the latter ceases, the usual equilibrium is established by a reverse motion. Since, according to the theory of Ampère, magnetism consists of currents of electricity revolving at right angles to the length of the magnetized bar, it follows that analogous results ought to be produced by magnetism; and for this purpose, instead of the battery current in the last series of experiments, let there be substituted a magnetized bar held at right angles to the wire connected with the galvanometer. 1. If this bar be suddenly brought down upon the wire perpendicular to its length, the galvanometer will indicate a current in an opposite direction to the hypothetical current in the lower side of the magnet. If the wire be E. and W. and the magnet be held across it with its N. pole toward the north, the current in the lower side of the magnet will be from the E. to the W., while the induced current will be in an opposite direction, *i. e.*, from W. to E. 2. When the motion of the magnet toward the wire is stopped, the induced current ceases, and no sign of electricity is exhibited so long as the magnet remains at rest. 3. When the magnet is suddenly removed from its proximity to the wire, a current in the opposite direction to that of the first, that is, in the same direction as the current in the lower side of the magnet, is indicated by the galvanometer. 4. When a bar of soft iron is placed across the wire at right angles, and this is suddenly magnetized, either by a galvanic current or by touching its ends to the poles of a horse-shoe magnet, a momentary current is produced in the wire in a direction opposite to that of the hypothetical currents of the near side of the magnet. 5. So long as the soft iron bar remains at rest and its magnetism suffers no change, no current is indicated by the galvanometer; but the moment the bar is unmagnetized a reverse current takes place. The two series of results we have given above are precisely analogous—the latter being merely a case of the former, in which the hypothetical currents of the magnet are substituted for the real current of the battery.—All the effects that we have described are produced with much more intensity, when, instead of using extended wires parallel to each other, we employ wires in the form of spirals, either flat or cylindrical. For example, to obtain an induced current of considerable intensity by means of magnetism, we place on a rod of iron, say 4 inches long, a spool of long wire covered with silk, which may occupy two inches of the length of the middle of the iron. If the two ends of this rod projecting beyond the spool be suddenly brought into contact with the two poles of a horse-shoe magnet, an induced current will be developed for a moment in the surrounding wire; and when the same rod is sud-

denly detached from the poles, a current in an opposite direction will take place; and in this way a continued series of alternate currents may be developed by alternately making and severing the contact of the poles of the magnet and the ends of the rod. A still greater effect may be produced by causing the rod to revolve on an axis at right angles to the middle of its length, before the poles of the magnet, so that each end in rapid succession may be brought in contact first with the N. and then with the S. pole, and so on.—Shortly after the discovery of the laws we have stated, Mr. Joseph Saxton, of this country, then a temporary resident of London, now of the U. S. coast survey, invented the first machine for giving sparks and shocks in accordance with the arrangement we have just described. Instead of a single bobbin of wire on the middle of a straight bar, he employed two, one on each leg of a bar of soft iron bent into the form of a horse shoe, which were made rapidly to revolve by means of a multiplying wheel before the poles of a magnet. At each half revolution the magnetism of the soft iron was entirely reversed, and in this way a series of currents was induced, of sufficient intensity to decompose water, fire combustible bodies, and powerfully to affect the nervous system. An instrument maker in London, who was employed to construct these machines, made a slight change in the arrangement, which principally consisted in placing the inducing horse-shoe magnet in a vertical position, and in causing the spools of wire to revolve in a plane parallel to its flat side, instead of parallel to its poles. This change, instead of improving the instrument, produced an opposite effect, since the strength of the induction was much diminished. The author of it, however, succeeded by advertisements, and an actual exhibition of it in France, in attaching his name to the invention, to the exclusion of that of Saxton. It is, however, gratifying to see that in the German works on the subject, and also in the better class of English publications, justice is done to the original inventor. The next important series of investigations on this subject, after the original discovery of Faraday, was by Professor Henry of Princeton, now secretary of the Smithsonian institution at Washington. He found that at the beginning and ending of a galvanic current in a long wire, an induced current was produced by an action which has sometimes been called the induction of a current on itself. To illustrate this, let the circuit of a small battery of a single element be closed by a short wire of about a foot in length, dipping into a cup of mercury. When the circuit is broken, no spark, or but a very feeble one, will be observed; but if we now substitute for the short wire one of say 100 feet in length and of considerable thickness, a vivid spark will be exhibited when the circuit is interrupted. To obtain this result in the most striking manner, we should employ a copper ribbon at least an inch and a half wide and 100 feet long, well covered with two thicknesses of

silk, and rolled into the form of a flat spiral. At the rupture of a battery circuit of which this forms a part, a loud snap and deflagration of the metal will be produced, when with a short wire, the battery remaining the same, scarcely any but a very feeble spark would be observed. By this arrangement several spires of ribbon react on each other, and increase the effect. By coiling a bell wire covered with silk of 600 or 700 feet in length into a spiral ring, the intensity will be so much increased that shocks may be obtained by means of a small galvanic battery of a single element. If the same wire be coiled into the form of an elongated spiral, and in the centre of this a rod of soft iron be placed, or what is better, a bundle of iron wire, the intensity is still more exalted. In this case the magnetic reaction is combined with that of the current of galvanism, and the two actions being in the same direction conspire to increase the effect. To produce, however, the most powerful inductive apparatus, a bundle of varnished iron wires of about 15 inches in length, and together forming a diameter of about an inch, is surrounded with a coil of thick copper wire well covered with silk of 800 or 400 feet in length. Around this, but separated from it by a cylinder of glass or pasteboard soaked in shell lac, is coiled a fine copper wire of 4 or 5 miles in length, care being taken that each spire be well insulated from every other. When a current of galvanism from a battery of even a single element is transmitted through the thick copper wire which surrounds the inner core or bundle of iron wire, the latter becomes magnetic; and at the instant the rupture is made in the battery current, a sudden cessation of the magnetism, as well as that of the current itself, induces a current of great intensity, though of small quantity, in the outer surrounding fine wire. Each spire of the long wire in this arrangement is subjected to the inductive influence; and the rapidity of motion of the electricity of the wire, were it not for the increased resistance, would be in proportion to the number of spires, or in other words to the length of the wire. This apparatus has received various ingenious improvements, the principle in all cases remaining the same. Dr. Page was the first to invent an apparatus on this plan by which the rupture of the battery current was rendered automatic; the magnetization of the iron core caused the attraction of a small magnet attached to one end of a lever which broke the circuit, and the consequent disappearance of the same magnetism allowed the end of the lever to fall into a cup of mercury and thus again complete the circuit. This instrument was much enlarged and improved by Ruhmkorff of Paris, and has of late been still further perfected by an ingenious American artisan, E. S. Ritchie of Boston. The essential desideratum in the construction of this instrument is the perfect insulation of the several spires of wire, so that the intense electricity which is produced may not strike across from one spire to another; and Mr. Ritchie effected

this by means of an ingenious process of winding, together with an improved insulation. An appreciable time is required to overcome the resistance of the wire and to give it a full charge of the current of electricity, and also to magnetize iron; hence in the instrument we have described, when a single battery is employed, the induced current, which gives the intense spark, is that which is produced at the rupture of the battery current. We can however increase the intensity at the beginning of the current, by employing a battery of a number of elements, which, producing electricity of greater intensity, more suddenly establishes the current in the wire, and more rapidly develops the magnetism of the iron.—*Currents of different Orders.* An induced current, by its action on a third conductor, may produce another current, and this another, and so on. If we call the current of the battery a current of the 1st order, the first induced current is named that of the 2d order, and so on. The discovery and investigation of the principle and properties of currents of the different orders is mainly due to Prof. Henry. On reflecting a little, it will be evident that these currents cannot be produced immediately by placing several straight wires parallel to each other and passing a current of electricity through one of them; in this case the battery current would act on the surrounding wires, and simply produce in each of them an induced current of the 2d order. To obtain, therefore, currents of the different higher orders, we employ a number of flat spirals, through one of which placed horizontally on a table is transmitted the current from the battery. Immediately above this, and separated from it by a stratum of air or a plate of glass, is a 2d flat spiral, the ends of which are connected with a 3d spiral placed at such a distance as to be entirely out of the influence of the battery current. Placing on the 3d a 4th (the two being separated as before by a plate of glass), and joining the ends of this with the ends of a 5th spiral, and so on, we shall have a series of successive currents. The current of the 1st order induced by the battery current induces a secondary current in the 2d spiral, which passes through the 3d spiral, and, thus free from the influence of the battery current, induces a current of the 3d order in the 4th spiral, which in turn, passing through the 5th spiral, induces a current of the 4th order in the 6th, and so on. Since each induced current must have a beginning and an ending, the current of the 3d order must in reality consist of 2 currents in immediate succession and in opposite directions, one produced at the beginning and the other at the ending; and for a similar reason a current of the 4th order must consist of 4 currents in immediate succession and opposite directions. On this account currents of the higher orders do not definitely deflect the needle of the galvanometer, but merely give it a slight tremor; the impulses in opposite directions follow each other so rapidly that the inertia of the needle is not overcome in the in-

terval between the two. The existence therefore of currents of different orders could not be determined by the galvanometer; they however give intense shocks, and also permanently magnetize steel needles. This latter effect will be understood when it is recollected that, although the series of waves in different directions are the same in quantity, they differ very much in intensity; that at the beginning of the agitation they have much the greatest energy. Hence the currents of different orders exhibit dominant impulses in definite directions. If the direction of the battery current be represented by +, the current of the 2d order at the beginning of the battery current will be represented by —; the dominant current of the 3d order +, of the 4th —, and so on; while the series of dominant impulses at the ending of the battery current will be +, +, —, +, —, +. When a circular plate of copper or any other conducting substance is interposed between two spirals placed one above the other, and a current from the battery is transmitted through, for example, the lower one, the induced current at the ending of the current of the battery, in the upper spiral, will affect the galvanometer as if no plate were interposed, while the physiological effect, or the power of giving shocks, will be entirely neutralized. This remarkable effect is due to an induced current in the interposed conductor, which is rendered evident by cutting out a slip of the metal extending from the centre to the circumference of the plate; or in other words, by removing one of the radii of which the circular plate may be conceived to be made up, and thus interrupting the circuit, in which an induced current otherwise could be produced; the shocks with the plate thus cut will be nearly as intense as when the plate is entirely removed. The same effect takes place when instead of the plates a 3d flat spiral is introduced between the 1st and 2d spirals; so long as the ends of this spiral are separated, its presence produces apparently no effect; but if the ends be closed so as to form a perfect circuit which can be traversed by the induced current, the power of giving shocks is neutralized. But the question naturally arises as to how the current in the plate affects the current in the upper spiral so as to destroy its power of giving shocks. The explanation of this is to be found in the fact, that while the current in the battery tends to induce a current both in the plate and in the spiral above it, each of these currents tends to induce an opposite current in the conductor of the other; we may therefore consider the upper spiral as being under the + influence of the current from the battery, and the — influence of the current of the plate; but as the current in the plate produces an equal inductive action in opposite directions at its beginning and ending, the only effect of it will be to prolong the action of the induced current in the upper spiral, or in other words, to diminish its intensity, and hence to neutralize its power to give shocks without perceptibly diminishing its ef-

fects on the galvanometer. These facts are of importance in the construction of the inductive apparatus previously described; for if two points of two adjacent spires of the long wire happen to be in metallic contact, so as to form a closed circuit, the effect is the same as that of the interposition of a plate or spiral between the battery current and the induced current; the intensity of the latter will be neutralized, and hence the necessity of the perfect insulation of the several spires of the long wire. For the same reason, if the iron core be enclosed in a hollow cylinder of copper or any other conducting metal so as to separate it from the outer coil of long wire, the great inductive power of the instrument will be neutralized; and it is also on this account that a bundle of varnished iron wires is employed for the core instead of a solid rod of iron. If however the copper cylinder we have just mentioned be interrupted by sawing out a thin slip parallel to its axis, and the solid iron core sawed down from its circumference to its centre, forming a saw-gash in the direction of the radius and in the plane of the axis, the interfering induced currents will be prevented. We have stated that an induced current of considerable intensity is generated in the conductor of the battery itself at the moment of the rupture of the circuit. This also produces, on the principle of the interposed plate, an adverse action which tends to diminish the energy of the induction apparatus, a defect in the instrument which M. Fesso has remedied by causing the rupture to take place in a cup of mercury the surface of which is covered with oil; the current of the battery is interrupted by drawing the end of the conductor out of the mercury while it still remains in the oil, which being a bad conductor stops in part the induced current. A similar effect is produced by suffering the extra current to expend itself on a large sheet of metal called a condenser. The facts we have here stated have been confirmed and extended by Masson, Verdet, and Abre of France, Dove, Wartmann, Riess, and Lentz of Germany, Marianini of Italy, and De la Rive of Geneva.—*Induced Currents from Discharges of ordinary Electricity.* When a discharge from a Leyden jar is transmitted through two spiral conductors, separated by a pane of glass or a stratum of air, induced currents analogous to those we have described are generated of great intensity, and under favorable circumstances the effect may be exhibited at a great distance. Prof. Henry succeeded in magnetizing needles with induced currents at the distance of several hundred yards, by stretching two long wires parallel to each other, and transmitting a discharge from a Leyden jar through one of them. He also obtained inductive effects of the same kind from the discharges of the thunder cloud at a distance of several miles. The direction of induced currents from discharges of the Leyden jar is apparently very capricious; they do not deflect the needle of the galvanometer, and the direction indicated

by the magnetization of needles, enclosed in a small helix which forms a part of the circuit, is subject to very complex variations; for example, when the two conductors are near each other the direction indicated by the magnetization of the needle is opposite to that of the current from the jar. If the two parallel wires or flat spirals be separated to a greater distance, the magnetization of the needle will indicate either a feeble current or one in an opposite direction; and if the distance be still further increased, the opposite polarity of a greater intensity will be exhibited. A change also in the direction of the magnetization of the needle will be produced by an interruption in the circuit of the induced current, or by the proximity of another closed circuit. These results have led European physicists to attempt to ascertain the direction of the current by chemical decomposition and other effects, but the results do not settle the question or throw much additional light on the character of the phenomena. Prof. Henry, however, after a very extended series of experiments, was enabled to refer them all to the peculiarity of the electrical discharge from the Leyden jar. This does not consist of a single discharge from the inside to the outside of the jar, as has been generally supposed, but in a series of discharges forward and backward alternately, until an equilibrium, as it were, is established by a series of oscillations, decreasing in intensity on account of the resistance of the wire, until the normal electrical equilibrium is attained.—*Induction in Masses of Metal in motion.* Arago in 1824 discovered that when a copper plate is made to revolve rapidly immediately under a magnetic bar freely suspended by an untwisted thread, the motion will be communicated to the latter even through a plate of glass; and also that when a magnetic needle is made to vibrate immediately over a plate of copper, it will come to rest much sooner than when the metal is removed. These facts remained entirely isolated until Faraday showed that they were the results of currents induced in the plate by the action of the magnet. We have seen that when a wire is made to approach at right angles to a magnetized bar, a current is produced in the former opposite to that of the hypothetical current in the near side of the magnet. A similar result must be produced when a plate of metal is moved in the vicinity of a magnetic pole. To illustrate this, let the N. pole of a strong magnetic bar be placed perpendicularly on the middle of an oblong plate of copper, extended in a N. and S. direction; while the bar retains this position, let the plate be drawn in the direction of its length, say southward under the magnetic pole. A magnetic bar thus placed with its N. pole downward has hypothetical currents revolving around it from W. to E. on the N. side, and from E. to W. on the S. side. If the plate therefore be moved southward, the N. part, which is approaching the pole, will have induced in it a current in an opposite direction to that of the current in the

magnet, which will in this case be a current directed toward the W., while the S. part of the plate receding from the magnet will have currents produced in it in the same direction as those in the magnet; but the currents on the S. side of the magnet are moving toward the W., and hence we shall have on both sides of the magnetic pole of the bar currents directed toward the W. during the time the plate is drawn from the N. toward the S. If we reverse the motion of the plate, the direction of the system of currents will also be reversed. If the poles of a horse-shoe magnet be furnished with two pieces of iron so as to form acting poles at a small distance from each other, and nearly in the same line and between these a circular disk of copper be made to revolve on an axis parallel to the line joining the poles, so that the latter shall be near the outer circumference, a system of currents from the centre to the circumference of the plate will be produced; the radii of the plate which are approaching and those which are receding from the line joining the magnetic poles will both conspire to produce this effect. If one end of a galvanometer be brought in contact with the axis of the circular plate, and the other made to touch the circumference while it is thus revolving, a constant current will be indicated by the instrument. If the direction of the revolution of the disk be changed, an opposite current will be produced; or if the velocity of the rotation be increased, a corresponding increase will be observed in the intensity of the current. If the magnet employed in this experiment be one of soft iron and suddenly excited by a galvanic current, the copper disk previously put in rapid motion will instantly be stopped. The current in the radii of the plate which are approaching the magnetic pole, being in an opposite direction to those in the magnet, will be repelled; while those in the radii on the other side of the pole, being in the same direction with the current in the magnet, will be attracted; and hence the resultant action of all the induced currents will be to stop the plate. A similar result is produced when a cube of copper of about an inch in diameter is suspended between the poles of a powerful electro-magnet, and caused rapidly to revolve, from the untwisting of a thread by which it is suspended; when the magnet is suddenly excited, the revolution of the cube is instantaneously arrested, and brought to rest without the least oscillation, as if the momentum and consequently the inertia of the mass were instantly annihilated. If, in the case of the arrangement of the revolving disk we have mentioned, a rapid motion be communicated to it by a train of wheels in opposition to the resistance between the induced currents and the magnet, a considerable exertion will be required to continue the motion; and since, according to the principle of the conservation of force, the muscular power expended must produce some effect, and no change is found in the condition of the metal after the experiment, the conclusion was drawn that the

energy exerted was expended in generating heat, the truth of which was established by Foucault. The disk, thus made to revolve in opposition to the force of the magnet, increases in temperature, and soon becomes sufficiently hot to set fire to an ordinary match.—*The Magnetism induced from the Earth and the Sun.* The earth being a great magnet, currents of electricity must be induced in all conducting material in which motion takes place at its surface. These currents are, however, of feeble intensity, but their existence may be shown by connecting the ends of a copper wire several hundred yards in length, covered with silk and wound around a wooden cylinder of about 2 feet in length, with a galvanometer, and by suddenly turning the axis of the former from a horizontal position into the direction of the dipping needle. During the downward motion of the N. end of the cylinder, the galvanometer will indicate an induced current in an opposite direction to that of the hypothetical current of the earth, and, when the motion is reversed, an induced current in the same direction as that of the current in the earth. From this result it must be inferred that electrical currents are constantly produced by the magnetism of the earth, since no change in the direction and position of a conducting body can take place without developing the inductive action. Moreover, since the sun has been proved to be a great magnet, exerting a powerful action on the earth, the daily rotation of the latter must subject it to an inductive action, similar to that we have described in the revolving plate of copper. There can be no doubt, in the present state of science, that such currents actually do take place, but their direction and intensity have not yet been ascertained. But from the association of the magnetic storms we have previously described with the occurrence of the aurora borealis, and also with that of the maximum number of spots on the sun, we are led to the conclusion that the three classes of phenomena are intimately connected, and that they furnish a subject of cosmical research of perhaps as great interest as any which have ever occupied the attention of the scientific world.

MAGNIFYING GLASS. See MICROSCOPE.

MAGNOLIA, a genus of highly ornamental trees, chiefly deciduous, but partly evergreen, and so named in honor of Pierre Magnol, prefect of the botanic garden in Montpellier (1638–1715). The magnolia belongs to the natural order *magnoliaceæ*, embracing, according to Don, 10 genera, of which, in North America, the magnolia and tulip tree (*Liriodendron*) are the most conspicuous. The foliage of the magnolias consists of large and entire leaves; their flowers are solitary and terminal, very large and highly scented; the stamens and stigmas are numerous; the carpels are disposed in crowded spikes, opening by an external angle, one or two seeded, permanent; the seeds are baccate, somewhat cordate, pendulous, hanging out beyond the capsules by a very long umbilical

cord; the capsules are aromatic, as well as the bark, which possesses bitter, tonic, and febrifugal properties. The magnolias belong to the eastern portions of Asia and North America exclusively. Those of each of these countries are also marked by structural differences in the mode of aestivation. Thus those which are natives of Asia have two opposite spathe-like bracts enclosing the flower buds, the ovaries are somewhat distant from each other, and the anthers burst inwardly. Of these, the yulan magnolia (*M. conspicua*, Salisbury) is a native of China, where it has been cultivated since the year 627. It is said to be naturally a very showy tree, attaining an altitude of 80 or 40 feet, but in gardens it usually reaches only 8 or 10 feet. A specimen, however, in the vicinity of Newburg, N. Y., which in 1850 had been planted out 14 years, is mentioned in Downing's "Rural Essays" as being then 20 feet high; it was grafted upon an American species, which may have favorably affected its growth. In that place the average period of blooming is from the 5th to the 15th of April. In the spring of 1849 there were 8,000 blossoms at once upon the specimen mentioned; and every year, whatever may have been the severity of the previous winter, it affords a fine display of its blossoms, sometimes succeeded by well ripened seeds. The flowers, in color a pure creamy white, in odor deliciously perfumed, combined with the hardiness of the tree, render this species very desirable in ornamental culture. In China, indeed, it holds the highest rank in the garden, being planted in the open ground and allowed to reach its full size, and likewise kept in boxes and pots, and forced throughout the winter, so as to keep up a perpetual supply of bloom in the apartments of the imperial palace. There are several varieties known; but the finest is considered to be Soulange's purple (*M. c. Soulangeana*), having the leaves, wood, and general habit of the original parent, but its blossoms more numerous, rather larger, and more showy, the outside of the petals being finely tinged with purple. It is thought to have originated by an accidental cross impregnation between the yulan and the purple magnolia, which were planted together on a lawn in the grounds of M. Soulange-Boodin, the distinguished French horticulturist. The purple-flowered magnolia (*M. purpurea*) is a native of Japan, having deciduous, obovate, acute, reticulately veined, almost smooth leaves, erect flowers of 8 sepals and 6 obovate petals, purple without and white within, very ornamental. This species we have seen standing the winter well on the Hudson river, when cultivated in the garden; but in New England it is usual to treat it as a pot plant, and give it the protection of the greenhouse, a mode adopted in the north of France and Germany. The slender magnolia (*M. Kobus*, De Candolle) is a native of the island of Nippon in Japan, having erect, solitary flowers, similar in color to those of the last; its foliage is deciduous, the leaves obovate, acuminate at both ends, produced

after the flowers, pubescent beneath when young, smooth when adult. It grows to the height of 10 feet, has a rough bark which smells like camphor, and is very ornamental, but requires protection against frost, which injures the blossoming. The purple magnolia of Thunberg, or obovate magnolia (*M. obovata*), is a very elegant shrub 5 feet high, native of Japan, and cultivated in the gardens of China and Japan as an ornamental object. There are 3 varieties known, having red-purple, white, and pure white flowers severally. It is said to thrive best when grown in the conservatory. A middle-sized tree, with large, pale, scentless, campanulate flowers, found indigenous in the fields near Canton in China, is the *M. inodora* of De Candolle. The *fula-coco* magnolia, as it is called at Macao (*M. coco*, De Candolle), has very large solitary flowers of 3 sepals and 6 fleshy petals, which as well as the sepals are curved inwardly; its color is pure white, and its scent exquisite; the flower bud before expanding is roundish and shaped like the coconut, whence its name. It is a shrub 5 feet high. The lofty magnolia (*M. excelsa*) is a native of Nepal, and is a magnificent tree from 50 to 80 feet high, bearing large, white, sweet-scented flowers; its foliage consists of oblong, elliptical, acuminate, glaucous leaves, netted with veins beneath. The wood is greatly prized by the inhabitants of Nepal, where it is employed in joinery, and commonly sold under the name of *champ*. In color it is of a fine yellow; its grain is close and fine. The brown-flowered magnolia (*M. fuscata*) is merely a shrub 8 or 4 feet high, with evergreen leaves, of elliptical, oblong shape; the flowers are small, very fragrant, and of a dull purple color; it is a native of China, where it is esteemed for its fragrant blossoms. With us it is a greenhouse plant, and a companion of the camellia. There are other Asiatic species mentioned by Don in his "General System of Gardening and Botany" (London, 1831), but he questions whether they belong truly to this genus.—The other division embraces those species which are exclusively American, having the flower bud enclosed in a one-spathed bract, the ovaries approximate, and the anthers bursting inward. The statelyest of the group is the big laurel (*M. grandiflora*, Mx.), the most remarkable of all the trees of North America for the majesty of its form, magnificence of foliage, and beauty of flowers. It sometimes rises to the height of 60, 70, or 80 feet, with a naked, smooth, columnar stem, and the head when not injured by accident is always regularly pyramidal or semi-elliptical. From May till August, in favorable situations, it is almost always covered with its brilliant white flowers terminating the younger branches. Its leaves are entire, oval, acuminate or even obtuse at the apex, 6 or 8 inches long, and borne on short petioles, evergreen, thick, coriaceous, and very brilliant on their upper surfaces. The flowers are 7 or 8 inches broad, white, and of an agreeable odor. The fruit is an oval cone or sort of

strobile, composed of a great number of cells, which, opening longitudinally, show within 8 or 4 vividly red seeds. The timber of the big laurel is best fitted for indoor carpentry, the wood being soft and remarkable for whiteness, and very durable on seasoning. The tree grows naturally in light, rich soils, commonly along the sea coasts of Georgia and Carolina. Its propagation is from seeds, which vegetate readily; and likewise from stools or layers, which require 2 years to put forth roots in sufficient abundance to admit of transplanting. It will not thrive north of New York, not being able to endure the usual cold of the winters. It is quite hardy at Philadelphia, and in various private grounds near that city there are fine specimens of considerable size growing without protection and blossoming every year. Some remarkable specimens are noticed by London as growing under cultivation in Great Britain, France, and Italy; several varieties are known among horticulturists, of which the Exmouth (*M. g. Exoniensis*) is the most distinct; on account of its flowering early and freely, and being rather hardier, it is the most deserving of general culture. The cucumber tree (*M. acuminata*) ranges from New York to Georgia; it is a fine species, sometimes exceeding 80 feet in height, and 3 or 4 feet in diameter at a yard from the ground. Its leaves are 6 or 7 inches long and 8 or 4 inches broad, oval, entire, and very acuminate, deciduous in the autumn and renewed in the spring; the flowers are 5 or 6 inches in diameter, slightly fragrant, the petals scarcely expanding, yellowish white and bluish or glaucous on the outside; the strobiles are 8 inches long, nearly cylindrical, convex on one side and concave on the other, and when unripe looking like a young cucumber, whence is derived the name of the tree; the cells contain each one rosy-colored seed. The wood of the cucumber tree is fine-grained, susceptible of a brilliant polish, and best suited for indoor work. This majestic and symmetrical species, says Darlington, a native of our mountains, is beginning to be appreciated and introduced as an ornamental shade tree. It is so hardy indeed as to thrive in northern Massachusetts, growing perfectly well in the botanic garden at Cambridge. The foliage, though large, is borne upon the very extremities of long bare branches, which deteriorates the general effect which we look for in ornamental forest trees. A much more beautiful tree is the auricle-leaved magnolia (*M. Fraseri*, Walter), found indigenous in the southern states from Virginia to Georgia and Florida. Its usual height is from 30 to 40 feet; its leaves are 8 to 12 inches long, mostly green on both sides, somewhat rhomboidal, acuminate at the summits, but divided into rounded lobes at the base. The flowers are 8 or 4 inches in diameter, white, of an agreeable odor, situated at the extremities of the young shoots; the strobiles are oval, 8 or 4 inches long, and when ripe of a beautiful rose color. The wood is soft, spongy, very light, and unfit for use. The heart-leaved magnolia

(*M. cordata*) is found upon the mountains of North Carolina and Georgia; it is from 20 to 50 feet high, its stem straight, and covered with a rough and deeply furrowed bark like that of a young white oak; its leaves are supported on petioles, 4 to 6 inches long and from 3 to 5 wide, smooth and entire; the flowers are yellow with faint streaks of red on the inside of the petals. The beauty of its yellow flowers, says Michaux, which form an agreeable contrast with its luxuriant foliage, and the advantage of its resisting an intense degree of cold, are its recommendations to amateurs. The large-leaved magnolia (*M. macrophylla*) is the most remarkable for the size of its leaves and flowers. Its trunk grows to a height of 80 or 40 feet, and with the fragile branches is covered with a white bark; the leaves are borne upon the ends of the branches, and measure from one to 8 feet in length; they are acute at the summit, tapering, cordate, scarcely auriculate at base, glaucous beneath, clothed with a silvery, silken pubescence when young. The flowers, when fully expanded, are 8 or 10 inches in diameter, white, the base of each petal having a purple spot inside; the strobile is roseate with scarlet seeds. The umbrella tree (*M. umbrellata*, De Lamarck) grows in every part of the southern states in rich soil, and ranges from northern New York and Pennsylvania southward and westward. This species is remarkable likewise for the dimensions of its leaves and flowers. Its trunk rarely rises above 35 feet, and its habit is more like that of shrubs. The leaves are thin, oval, entire, and acuminate at both extremities, 18 or 20 inches long and 7 or 8 broad; they are often displayed in rays at the extremities of the vigorous shoots, whence the trivial name; the flowers are 7 or 8 inches in diameter, white, composed of several oblong concave petals of an unpleasant sourish odor; the strobiles are conical, 4 or 5 inches long, of a beautiful rose color, with seeds of a pale red; as these soon grow rancid after ripening, they should be sown immediately, if seedlings are wanted. The wood is so soft as to be of little use. This species flourishes in the vicinity of Boston, but from its straggling habit of growth is not very ornamental. The glaucous magnolia, or sweet bay (*M. glauca*), is certainly one of the loveliest shrubs of North America. Its range is from Cape Ann in eastern Massachusetts to Louisiana and Florida. In very sheltered situations it rises into the form of a small tree 20 feet or more high, and Elliott speaks of specimens in the low country of Carolina 50 or 60 feet high; but as it occurs at the north it is usually a bushy shrub having many upright stems from the same root. These stems are erect, smooth, and of a bright green color when young, the leaves of a shining dark green above and glaucous beneath; they fall off on approach of autumn, leaving the stems perfectly bare. The flowers, borne in the bosom of the young leaves at the extremities of the branches, are solitary and seated upon a short thickened peduncle; they appear in succession for many

weeks, beginning to bloom in July. Their color is a creamy white, turning yellowish on fading; the petals of the flower, which are 8 to 14 in number, are enclosed within 8 obtuse spatulate sepals. The fruit (strobile) is a cone consisting of numerous cells, which on opening allow the escape of bright scarlet seeds, each suspended, after the manner of the other species, by an umbilical thread. The fragrance which these blossoms emit is extraordinary, and perfumes the air around to a great distance. The species is not difficult of cultivation, growing readily from its seeds, and even from the suckers removed carefully from the main rootstocks. We have known these latter to succeed admirably on being planted out in prepared borders of peat mixed with sphagnum moss, thus imitating their native soil. It is thus cultivated in many gardens about Boston from plants transferred from the swamps of Gloucester, Essex co., Mass., probably the most northern natural limit. The flowers are gathered by women and children for sale in the railroad cars, and command considerable prices either by the single flower or in bunches of 5 or 6. The glaucous magnolia succeeds well in Europe as an ornamental shrub. It was introduced into England in 1688 by Banister, an early observer of North American plants. Several garden varieties are known abroad, and some hybrids, so called, have been raised, of reputed merit. It seems, however, scarcely possible that any improvement in the beauty of the flower or even in the habit of the plant could be expected from experiment or artificial treatment. It requires a soil so wet as to preclude its general introduction into gardens, where it would be welcomed. The glaucous magnolia has a variety of names. Among others, Kalm tells us, in his "Travels in North America" (London, 1770-'77), that the Swedes and English call it beaver tree, because the root of this tree is the dainty of beavers, which are caught by its means. The bark of the glaucous magnolia is bitter, with a strongly pungent taste, which approaches that of sassafras. The aroma resides in a volatile oil, which is probably an essential oil or a variety of camphor. The dry bark affords a bitter extractive substance. As a medicinal article magnolia is to be considered an aromatic tonic, approaching in its character to *cascarilla*, *canella*, &c. Several other species of magnolia resemble the present very closely in their sensible properties, and as far as they have been tried they are similar in their medicinal effects.

MAGNUS, ALBERTUS. See ALBERTUS MAGNUS.

MAGNUSSON, FINNUR, an Icelandic archaeologist, born in Skalholt, Iceland, Aug. 27, 1781, died in Copenhagen, Dec. 24, 1847. He was connected with the most distinguished families of the island. He studied at the university of Copenhagen, returned to Iceland in 1808, and practised as an advocate. In 1815 he was appointed professor at Copenhagen, and in 1819 began to lecture in the university and the academy of

fine arts on the old northern literature and mythology. His *Bidrag til nordisk Archaologie* appeared in 1820, in which he maintained the plastic symbolical ideality of the northern myths, which makes them as appropriate as those of the Greeks for artistic representation. In 1828 he published a *Præcis Veterum Borealiæ Mythologiae Lexicon et Gentile Calendarium*. His most important investigations appeared in his translation and explanations of the elder Edda, *Aldre Edda, oversæt og forklaret* (4 vols., Copenhagen, 1821-'3), and in his *Eddalåren og dens Oprindelse* (4 vols., 1824-'6), an exposition of the whole doctrine of the Edda from the standpoint of comparative mythology. In connection with Rafn he produced important works on the historical monuments and archæological remains of Greenland (8 vols., Copenhagen, 1838-'42), and on Russian antiquities (2 vols., 1850-'52). Beside a large number of monographs on special runic and historical subjects, he published in 1841 a large work on runes, entitled *Runamo og Runerne*.

MAGOON, ELISEA L., an American Baptist clergyman, born at Lebanon, N. H., Oct. 20, 1810. His grandfather was a clergyman, and a participator in the scenes of the revolution; his father an architect, who after considerable success in his profession was reduced to penury by protracted sickness. At 16 years of age young Magoon was apprenticed to the bricklayer's trade, which he followed till his 20th year, and by the use of the trowel during his vacations, and in the intervals of study, supported himself through a preparatory collegiate and theological course. He was ordained in 1840, and immediately settled at Richmond, Va., as pastor of the 2d Baptist church, where he remained 6 years, and then made the tour of Europe. On his return he became pastor of a church in Cincinnati. Here he remained till 1849, when he removed to New York city and became pastor of the Oliver st. Baptist church. In 1857 he was called to the pastorate in Albany, where he now resides. In 1858 Rochester university conferred upon him the degree of D.D. Dr. Magoon's published works are: "Orators of the American Revolution" (New York, 1848); "Living Orators in America" (New York, 1849); "Proverbs for the People" (Boston, 1848); "Republican Christianity" (Boston, 1849); and "Westward Empire" (New York, 1856).

MAGPIE, a conirostral bird of the crow family, and the genus *pica* (Briss.). The bill is long and strong, about as high as broad at the base, with compressed sides, hooked tip, and covered with bristly feathers nearly to its middle; wings long and rounded, with the 1st quill short, falcate, and attenuated, and the 4th and 5th nearly equal and longest; the tail is very long and graduated, the lateral feathers scarcely more than half the middle; tarsi longer than the middle toe, strong, and covered with broad scales in front; toes strong, and the hind one long, with curved sharp claws; a naked patch behind and below the eye; head without crest;

nostrils circular. Nearly a dozen species are described, inhabiting the old world and North America; they are seen generally in pairs, but sometimes in flocks, noisy and restless; they will eat vegetables, grains, mollusks, worms, insects, and even carrion, and destroy eggs and young birds. The nest is made upon high trees or in thick bushes, of large size, of coarse materials plastered with clay, and softly lined with wool, hair, and feathers; there is generally a kind of roof over the nest, with a narrow entrance for the birds. The common magpie of Europe (*P. melanoleuca*, Vieill.) is 18 inches long, with an extent of wings of 2 feet, the tail 10 inches, and bill 1½ inches; the plumage of the head, neck, back, anterior part of breast, and abdomen black; rest of the breast and outer scapulars white; the tail and wings splendid with green and purple, most of the inner web of the outer quills white; iris dark. This elegantly formed and handsome bird is generally distributed in the wooded districts of Europe; in form it approaches nearest to the jackdaw, but the wings are shorter and the tail much longer. It is fond of coming near human habitations; the flight is rather heavy, but moderately rapid; the notes are almost incessant and hard; the tail is elevated while walking. The eggs are from 8 to 6, about 1½ by 1 inch, of a pale green with brown and purplish freckles, or pale blue with smaller spots resembling those of the jay; it is fond of building in the same locality, and frequently in the same nest. From its docility it is an agreeable pet, though it has the propensity common to the crow family of stealing whatever objects, and especially bright ones, may attract its attention. The American magpie (*P. Hudsonica*, Bonap.), though closely resembling the European, is a distinct species; it has a much longer tail, is of larger size, with a thicker bill, grayish blue outer ring to the iris, the feathers of the throat spotted with white, and the hind part of the back grayish. It is found in the arctic regions, and, in the United States, from the high central plains to the Pacific, north of California. The yellow-billed magpie (*P. Nuttalli*, Aud.), from California, resembles a small specimen of the preceding bird, and cannot be distinguished from it except that the bill is yellow instead of black; it is by some considered a variety of the common species.

MAGYAR, LÁSZLÓ, a Hungarian traveller, born at Theresienstadt (Hung. Szabadka) in 1817. He attended the naval school at Fiume, entered the Brazilian navy in 1844, and took part in the war between Rosas and Uruguay. He proceeded in 1846 to the Portuguese settlements on the W. coast of Africa, and became commander of the fleet of the negro ruler of Calabar. Having familiarized himself with several negro languages, he left San Felipe de Benguela, Jan. 15, 1849, crossed the table-land of Nano to a comparatively low country, Bihé, where he settled at Masziskuitu, marrying the daughter of a chief, with whom he received, as he wrote to his father, many

elephants and tiger-hunters, but no gold. On Feb. 20, 1850, he left his new home with his wife and nearly 800 armed men, crossed the river Kokema, arrived in 7 days at the Quanca, ascertained the source of that river, then advanced into the interior, crossed 4 great rivers, explored the forests of Kibokue (Quiboque), and after leaving Kariongo, a village of Bunda, found himself in an elevated tract, which he estimates to be 5,200 feet above the level of the sea, and which he calls the highest land of middle Africa, and the mother of the waters, from the great number and extent of rivers rising there. Crossing the Lumegi, he thence proceeded to the country of the Alunda, or the kingdom of Kalunda; and reaching in 1851 the Oazembe river, he pursued his course with comparative safety, explored the country from E. to W. as far as the Liba river, and thence northward to the city of Matiamvo, testing his observations by travelling over the same region in different directions. In 1851 Magyar suggested that his countrymen might assist him in the enterprise, and through the interference of the Portuguese government, which has promoted him to a high civil office at Loando with the rank of major, the narrative of his travels from 1849 to 1857 was sent to Pesth, and the 1st volume published in 1859 at the expense of the Hungarian academy, and a German translation by Hunfalvy has since appeared. Among the recent communications received from him in Europe is one dated Lueira, Nov. 16, 1858, in which he expresses his gratification at the receipt of some scientific publications, after a residence of 12 years in Africa, and acknowledges the great value of Dr. Livingstone's labors; but having passed over a part of the same ground, he contests the accuracy of some of his statements, and his map (which is also in course of publication) illustrates the points upon which the two travellers are at issue.

MAGYARS. See **HUNGARY**, and **HUNGARIAN LANGUAGE**, vol. ix. pp. 356 and 364.

MAHANUDDY, a river of Hindostan, rising in the native state of Nowagudda, on the S. W. frontier of Bengal, in lat. 20° 20' N., long. 82° E. It flows first E., then N. E., and finally S. E., through the territory of Nagpoor and the small native possessions on the British frontier, and falls into the bay of Bengal through numerous deltoid arms which divide just below the town of Outack, where during the rainy season it is 2 m. broad; its principal mouth is in lat. 20° 20', long. 86° 50'. It is about 550 m. long, and is navigable by boats 460 m. Bishop Heber observed its waters, which being fresh are specifically lighter than those of the sea, floating on the bay of Bengal 2 or 3 m. out from land, "exactly like a river about half a mile broad, smooth, dimply, and whirling."

MAHASKA, a S. E. co. of Iowa, intersected by the Des Moines and the N. and S. forks of Skunk river; area, 576 sq. m.; pop. in 1859, 14,516. The surface consists in great part of level or undulating prairies, diversified with

woodlands, and the soil is productive. Coal and limestone abound. The productions in 1859 were 25,441 bushels of wheat, 841,931 of Indian corn, 7,738 of oats, 11,902 tons of hay, 268,481 lbs. of butter, and 18,064 galls. of sorghum molasses. Capital, Oskaloosa.

MAHMOUD I., sultan of Turkey, a son of Mustapha II., born in Constantinople in 1696, died in Dec. 1754. He was raised to the Ottoman throne in 1730, after the deposition of his uncle Ahmed III. The janizaries, who had revolted against the latter and made Mahmoud sultan, exacted from him a promise to continue the war begun against Nadir Shah of Persia. His military operations, however, were disastrous, and he finally concluded a peace in 1736. In 1734 the Russians began hostilities, and in 1737 took Otohakov and Kinburn, while their Austrian allies invaded Wallachia. The latter were however defeated by the Turks at Krotzka on the Danube in 1739, upon which the court of Vienna made peace, on disadvantageous terms relinquishing not only what its forces had recently taken, but also Belgrade, captured during a former war. The Russians obtained a more favorable treaty, retaining all their conquests. In 1743 hostilities again broke out between Persia and Turkey, and were closed by a treaty unfavorable to the latter. Notwithstanding the wars in which his army was engaged, Mahmoud was a man of peaceful disposition, and Turkey was comparatively well governed under him.

MAHMOUD II., sultan of Turkey, the younger son of Abdul Hamed, born in Constantinople, Sept. 2, 1789 (or according to some authorities, July 20, 1785), died there, July 1, 1839. During his youth, passed in the seraglio, he became familiar with Persian and Turkish literature, and is said to have manifested at an early age a character of great firmness not unmingled with cruelty. His elder brother Mustapha IV., who ascended the throne in 1807, had ordered him to be put to death as a possible rival, when Ramir Effendi, paymaster of the army, rescued him. Bairaktar, the pasha of Roostchook, raised an insurrection, deposed Mustapha IV., and placed Mahmoud on the throne, July 28, 1808. Bairaktar became grand vizier, and with the sultan boldly attempted to carry out those European military reforms for promoting which Selim III., the predecessor of Mustapha, had been deposed. The janizaries, whose organization was threatened by this, rose in rebellion, and stormed the seraglio. Bairaktar blew himself up with his enemies, and Mahmoud as a desperate measure ordered Mustapha IV. and his infant son to be strangled, and his 4 pregnant sultanas to be sewn in sacks and thrown into the Bosphorus. After a long struggle, amid pillage and conflagrations, the rebels gained a victory, and the sultan was obliged to submit to their demands. As he was however the only living descendant of Osman, they recognized him as their ruler, dreading the anarchy which must ensue should the royal family become extinct. - He now, un-

der very unfavorable circumstances and without resources, continued the war with Russia and the Servians, until, when totally exhausted, his divan concluded a treaty with the Russians at Bucharest, May 28, 1812, by which the Pruth became the boundary of the two empires, the Servians receiving the promise of an amnesty. From this time the daring and despotic character of Mahmoud manifested itself with striking effect, both in reforms at home and in wars abroad. The Wahabees of Arabia were subdued by Ibrahim Pasha. Dreading the increasing power of Ali Pasha of Yanina, Mahmoud made war on him and crushed him in 1822. In 1821 his Greek subjects revolted. By the aid of Mehemet Ali he carried on a successful war against them, but with such extreme cruelty that France, Russia, and Great Britain remonstrated. Their mediation being disregarded by Mahmoud, they attacked and destroyed his fleet at Navarino in 1827. In 1826, after a desperate struggle, in which he displayed great courage and ability, he had overthrown the janizaries, and organized an army on European principles. With full confidence in its power, he did not shrink from a war against Russia, but was defeated, Diebitsch even crossing the Balkan, and in consequence of the mediation of England, France, and Prussia, he signed the treaty of Adrianople in 1829. In 1832, Mehemet Ali having refused to withdraw his troops from Syria, which he had occupied as well as Candia, Mahmoud made energetic preparations against him, but was defeated by Ibrahim Pasha at Hems and Konieh, and was only saved by Russian intervention from being dethroned. The result was an alliance for mutual defence between Turkey and Russia. In the mean time Mahmoud had done much to improve the domestic condition of his kingdom. Roads were made, postal communication was established, ambassadors were appointed to the European courts, and women were allowed to appear in public, measures which did not fail to make him many enemies among the conservative party. Justice was speedily and severely administered, and an energetic though unscrupulous police, often aided by the sultan himself, disguised, did much to establish order. But his oppression of all the higher officers of his kingdom, and the frequency with which he plundered, displaced, or slew them, deprived him of trustworthy aid, and his reign was a succession of revolts and treason. He withdrew favor from men of ability to place it in a barber, and in a buffoon named Khalet Effendi, through whose intrigues and selfish advice he oppressed his pashas, and drove many provinces to rebellion. In 1839, being still determined to reduce Mehemet Ali, he made war on him, claiming tribute due. His army was again defeated by Ibrahim, but he died before the news reached him. He was succeeded by his son, the present ruler, Abdul Medjid.

MAHOGANY (*Swietenia mahoganii*, Linn.), a tree of the natural order *cedrelacea*, a native

of South America, Honduras, and the West India islands, and among the most valuable of tropical timber trees. The genus is named in honor of Baron Gerard van Swieten. The mahogany species is a large, spreading tree, with pinnate, shining leaves. The trunk often exceeds 40 feet in height and 4 or 5 feet in diameter. The flowers, in spikes like the lilac, are whitish or yellowish red, and are succeeded by fruit or capsules of an oval form and the size of a turkey's egg. Though the growth is very rapid, the wood is hard, heavy, and close-grained, of a dark, rich, brownish red color. The so called Spanish mahogany, which includes all the above except that from Honduras, is imported in logs about 10 feet long and 2 feet square. The Honduras mahogany is usually larger, the logs being from 12 to 18 feet long, and from 2 to 3 feet square. It is chiefly obtained upon low moist land, and is generally soft and coarse. The trees which grow on rocky elevated grounds are of smaller size, but the wood is harder and more beautifully veined. The coarse variety is much used for a foundation on which to veneer the finer varieties of the wood, and from its spongy nature is well adapted for this purpose, as the glue adheres very firmly to it. The natives make this wood serve many useful purposes, as canoes, handles for tools, &c. Some have supposed the Honduras to be a different species from the Spanish, from its being lighter in color, as well as porous in texture; but it is now ascertained that these differences arise from the different situations in which the trees are found. The largest log ever cut in Honduras was 17 feet long, 57 inches broad, and 64 inches deep, measuring 5,421 feet of inch plank, and weighing upward of 15 tons. The mahogany brought from Africa and the East is decidedly inferior to either of the above; but a fine specimen sent from Calcutta to the great exhibition in London proves that the best quality may be raised in the East Indies. The Spanish mahogany is considered the most useful of all woods for household furniture, for which it is adapted especially by its durability, beauty, hardness, and susceptibility of polish. Alkalies are often applied to the lighter colored wood in order to deepen the shade, but the best effect is produced by using a colorless varnish which brings out in fresh beauty the rich veins, and leaves its natural tints unchanged. The grain, or curl as it is called, is sometimes so beautiful, that it increases the value of the log to an enormous price; several logs have been sold for over \$5,000 each. In one instance 8 logs, each 15 feet long and 38 inches square, produced from a single tree, brought \$15,000. It is usually a difficult matter for dealers to judge with precision of the worth of the wood in logs. Mahogany is said to have been employed about the year 1595 in the repairing of some of Sir Walter Raleigh's ships, but it was not used for cabinet work till 1720, when a few planks were brought from the West Indies and given to Dr. Gibbons, a physician of London. A man named

Wollaston, being employed by him to make some trifling articles from this wood, discovered its rare qualities, and soon brought it into high repute.—The imports of mahogany into the United States in the year ending June 30, 1859, chiefly from Hayti, Cuba, and Honduras, were valued at about \$264,000, of which \$44,000 worth was reexported, chiefly to England, Sicily, and Russia. Manufactured mahogany was imported to the value of \$14,000, chiefly from France, England, and Mexico.

MAHOMET. See **MOHAMMED.**

MAHON. See **PORT MAHON.**

MAHON, LORD. See **STANHOPE, EARL.**

MAHONING, an E. co. of Ohio, bordering on Penn., drained by the Mahoning and Little Beaver rivers; area, 422 sq. m.; pop. in 1850, 28,785. It has an undulating surface and a highly productive soil. Coal and iron ore are found. The productions in 1850 were 151,110 bushels of wheat, 261,019 of Indian corn, 285,148 of oats, and 288,010 lbs. of wool. There were 10 grist mills, 26 saw mills, 5 iron founderies, 2 woollen factories, 13 tanneries, 58 churches, and 6,670 pupils attending schools.

MAHONY, FRANCIS, an English journalist and author, born in Ireland about 1805. He was sent during boyhood to several Jesuit colleges in France and subsequently to Rome, where he remained for some years, and until he had taken orders. He soon abandoned the clerical vocation to devote himself entirely to literature. He wrote for "Fraser's Magazine," at the time when Maginn, Carlyle, and many other distinguished men contributed to it, "Reliques of Father Prout," since collected in a book (2 vols., London, 1835; 2d ed., 1 vol., London, 1859), which ranks among the most genial works of modern humor. Mahony has been an extensive traveller in Europe and the East, and is an able linguist, versifying with elegance in several languages. He has written several books, but is best known to the English public as a journalist. In 1851 he was examined by the parliamentary committee on the mortmain laws, as regarded their effect in the Papal States. Of late years he has resided in Paris, whence he contributes correspondence to English journals.

MAHRATTAS (*Maha-rashtra*, great people), a people of Hindoestan, found chiefly in the Bombay and Madras presidencies. Their primitive territory is said to have included Candeish Baglana and a part of Berar, and to have extended N. W. as far as the river Nerbudda; but they subsequently spread themselves across the whole peninsula, through the present dominions of Holkar, Sindia (Gwalior), and the Guicowar, and the country of Nagpoor, in which they still form an important element in the population. Some writers, however, regard them as foreigners who emigrated from the W. part of Persia about the 7th century, and Pickering assigns them an Arabian or Egyptian origin. They are Hindoos of the Soodra caste, and even their chieftains, who derived their ascendancy from being the head men of villages, be-

longed originally to that low rank; but they are not strict in religious observances, and abstain from no kind of food except beef. Perfidy and cruelty are their most characteristic vices. In personal appearance, though hardy, active, and well proportioned, they are very ill-favored; their stature is small, their skins are dark, and their features irregular. They are much given to athletic exercises, and are excellent horsemen, but their turbulent and predatory habits unfit them for regular military service. The Mahrattas first appear in history about the middle of the 17th century, when they possessed a narrow tract of territory bordering on the Arabian sea and extending nearly from Goa to Guzerat. Sevajee (born 1626, died 1680), the son of an officer in the service of the last Mohammedan king of Bejapoor, was the founder of the Mahratta empire. Having collected an army among the mountains, he overthrew the kingdom of Bejapoor, and gradually united under his own rule the multitude of petty states among which the Mahrattas were divided. His son Sambajee extended his conquests, but was finally put to death by Aurungzebe. Under Saho, grandson of Sevajee, the prime minister or peishwa and the paymaster-general divided the empire between them; the former establishing at Poonah an actual supremacy over the confederate Mahratta states, and the latter founding the new kingdom of Nagpoor. Guzerat, where subsequently arose the independent power of the Guicowar, Orissa, and a great part of Malwah, were overrun by the Mahrattas, and in 1758 they made themselves masters of Delhi. Defeated however by Ahmed Shah Dooranee in the great battle of Paniput (1761), their downfall began; and though they again obtained a footing in Delhi (1771), they lost valuable possessions to the armies of Tippoo Sahib, and were driven from the Mohammedan metropolis by the British in 1803. A few years later two other Mahratta chiefs, Holkar and Sindia, who had founded independent states at Indore and Gwalior, entered into a confederacy with the peishwa and the Berar rajah against the British. After a protracted war the Mahratta power was finally overthrown (1819), the peishwa became a prisoner, and his title and authority were abolished.

MAI, ANGELO, an Italian scholar and cardinal, born at Schilpario, a village of the province of Bergamo, March 7, 1781, died at Albano, Sept. 8, 1854. At the age of 17 he entered the novitiate of the society of Jesus. In 1818 he was named an associate of the Ambrosian college, and soon after one of the sixteen attached to the Ambrosian library. When the society of Jesus was formally revived by Pope Pius VII. in 1814, Mai, who had never taken the solemn vows of the order, was induced to remain a member of the secular clergy. In 1819 he became chief keeper of the Vatican library at Rome, soon after librarian, in 1825 supernumerary prothonotary apostolic, and in 1838 prefect of the congregation of the Index

and cardinal. His literary reputation was established by his careful exploration of the Ambrosian library, and by several important discoveries in the then almost unknown department of palimpsests, or rewritten manuscripts. Among his discoveries in Milan were fragments of the orations of Cicero *pro Sc Mauro*, *Tullio*, *Flacco*, and in *Clodium* (Milan, 1814); several orations of Cornelius Fronto, and several letters of the emperor Marcus Aurelius and of Lucius Verus (Milan, 1815; new ed., Rome, 1846); a fragment of 8 orations of Q. Aurelius Symmachus (Milan, 1815; new ed., Rome, 1846); the complete oration of Iseus on the inheritance of Cleonymus (Milan, 1815); an oration of Themistius (1816); several books of the "Roman Antiquities" of Dionysius of Halicarnassus (1816); an *Itinerarium Alexandri*, and a work of Julius Valerius, *Res gestæ Alexandri* (1817); fragments of Eusebius and Philo, and of Eusebius's *Chronicorum Canonum Libri duo* (1818), which he restored in conjunction with Dr. Zohrab from an Armenian manuscript; and fragments of the Iliad from the oldest known manuscripts (Milan, 1819). He also discovered at Rome the long-sought work of Cicero, *De Republica* (Rome, 1822). As keeper of the Vatican library, Mai resolved to publish collections of the unpublished sacred as well as profane authors from the Vatican manuscripts, similar to those of Muratori, Mabilion, and Montfaucon, leaving to future scholars the task of critically editing, commenting, and translating. On this plan he commenced in 1825 the magnificent *Scriptorum Veterum Nova Collectio e Vaticanis Codicibus edita* (10 vols. 4to., Rome, 1825-'88), which was followed by *Auctores Classici e Vaticanis Codicibus editi* (10 vols. 8vo., 1828-'38), and the *Spicilegium Romanum* (10 vols., 1839-'44). His last publication, *Nota Bibliotheca Patrum* (6 vols., 1845-'53), forms an indispensable supplement to almost all collective editions of the church fathers. He had also prepared an edition of the celebrated biblical *Codex Vaticanus*, but died before the completion of the work, which was published by Vercellane (Rome, 1857).

MAIDSTONE, a municipal and parliamentary borough and market town of Kent, England, situated on the right bank of the Medway, 27 m. W. by S. from Canterbury, and 56 m. S. E. from London by the south-eastern railway; pop. in 1861, 20,801. The principal manufacture is of paper. The great parish church of All Saints, erected in the 14th century, and now splendidly restored, is one of the largest edifices of the kind in England. There are many good schools, one of which, All Saints college, founded in 1846, is kept in the building of the old college of All Saints, suppressed by Edward VI. The navigation of the Medway has been of late improved, so that vessels of above 70 tons can now reach Maidstone, and its traffic has been thereby greatly increased.

MAIL, and **MAIL COACHES**. See **POST**.

MAIL, **COAT OF**. See **ARMOR**.

MAILATH, JÁNOS NEPOMUK, count, a Hungarian author, born in Pesth, Oct. 5, 1786, died by his own hands, Jan. 8, 1855. He was employed in the public service of Hungary until a disease of the eyes compelled him to relinquish his position; and resuming it at a subsequent period, he was finally thrown out of office by the revolution of 1848. Poverty induced him to emigrate with his daughter Henrietta to Munich; and to escape becoming a burden to their friends, father and daughter drowned themselves in the lake of Starnberg, an event which created great sensation in the Austrian empire. He was much respected for his generous qualities, and published a "History of the Austrian Empire," a "History of the Magyars," and other works, all in German, including original poems and numerous translations from the Hungarian, among others the masterpiece of Eötvös, the "Village Notary."

MAIMBOURG, LOUIS, a French historian, born in Nancy in 1610, died in Paris, Aug. 13, 1686. At the age of 16 he entered the society of Jesus, and was sent to Rome to study theology. On returning to France, he became professor of belles-lettres in the college of Rouen, and was afterward appointed to the office of preacher. In 1682 he was expelled from his order for defending the tenets of the Gallican party; but Louis XIV. settled a pension on him. He spent his latter days in the abbey of St. Victor in Paris, engaged in literary pursuits, and at the time of his death was writing a history of the English reformation. The most important of his works are histories of Arianism, of the iconoclasts, of the schism of the Greeks, of the great schism of the West, of Lutheranism, of Calvinism, and of the league. A uniform edition of Maimbourg's histories was published in 1686-'7 (14 vols. 8vo., Paris).

MAIMONIDES, MOSES (Heb. *Rabbi Mosheh ben Maimon*, commonly abridged into the initial name *RaMBaM*; Arab. *Abu Amran Musa ibn Abdallah ibn Maimon Al-kortobi*), a Jewish theologian and philosopher, born in Cordova, Spain, March 30, 1135, died in Cairo, Egypt, Dec. 13, 1204. He was the descendant of a family distinguished in the annals of the Jewish community of his native city, at that period a principal seat of Arabic learning, and received from his father Maimon, who made himself known as a theological and astronomical writer in Arabic, a superior education. His energetic, inquiring, and logical spirit early embraced the whole range of the scientific studies of his time, and he had hardly reached the age of manhood when he was distinguished by a rare proficiency in mathematics, astronomy, medicine, philosophy, and theology, as well as by a surpassing ability as a writer in Arabic and Hebrew. Few particulars, however, are known of his earlier life. Of his teachers, the celebrated Averroes became his friend. In consequence of the great persecution of Jews, Christians, and sectarian Mohammedans by the dynasty of the Almohades in Cordova, he re-

tired with his father to north-western Africa; but meeting there with the same spirit of fanaticism, he finally went to Egypt in 1165, passing through Acre and Jerusalem, where his father died, and establishing himself in Mitzr or Fostat (Old Cairo). Here he maintained himself for some time by trade, but soon after found ample opportunity to display his scientific acquirements, and was appointed physician to the court of the sultan Saladin, which office he also held under two successive reigns. At the same time he was active as a rabbi in the Jewish congregation of Cairo, and especially as a theological teacher, his fame for knowledge, purity of character, benevolence, and piety attracting numerous pupils not only from the surrounding regions of the East, but also from the most distant countries of the West. But he exercised a far more powerful influence upon his brethren by his numerous writings, with few exceptions in Arabic, almost all of which have since been acknowledged as standard works. The most distinguished Hebrew translators of the age vied in spreading his masterpieces all over the Jewish world, and thus enabled him to become almost the second lawgiver of his people, and to inaugurate among them a period of literary and philosophical activity, which is still regarded as the golden age of the Jews in exile. Of his works, of which numerous original MSS. are extant in the libraries of Oxford, Rome, Parma, &c., embracing among others treatises on medicine, mathematics, and astronomy, the most frequently reprinted (in Hebrew translations or original) are: *Perush hamishnah* ("Commentary on the Mishna"), including an introduction and an ethical treatise known under the title of *Shemonah perakim* ("Eight Chapters"); *Sefer hamitzvot* ("The Book of the Commandments"), a systematic compend of the biblical commandments, both positive and negative, according to the rabbis amounting to the number of 613; *Sefer hakigayon* ("The Book of Logic"); *Mishneh torah* ("The Copy of the Law"), a general code of Jewish observances, written originally in Hebrew, in many respects the most extraordinary strictly rabbinical production, generally known under the appellation of *Yad hasakah* ("The Strong Hand"), from its 14 divisions, *Yad* signifying hand and fourteen; and *Moreh nebukhim* ("The Guide of the Erring"), a philosophy of Judaism, which from its influence on the development of Jewish science and genius is the most important production of the author, and of which the original Arabic text, in Hebrew letters, from an Oxford manuscript, with a French translation and notes by S. Munk, is now in course of publication at Paris (*Le guide des égarés, traité de théologie et de philosophie par Moïse ben Maimoun*, 8 vols.). Some of the views of Maimonides having been violently attacked by various western rabbis, his orthodoxy and the rights of philosophy in the synagogue were vindicated among others by his learned son and successor as physician to the Egyptian court, Abraham ben Moses.

MAINE, one of the eastern states of the American Union, and the tenth admitted under the federal constitution, situated between lat. 42° 57' and 47° 32' N., and long. 66° 52' and 71° 06' W.; extreme length N. and S. 303 m., extreme width 212 m.; average length about 200 m., average width about 160 m.; area, 31,766 sq. m., or 20,330,240 acres, being 1.08 per cent. of the whole territory of the United States in 1850. It is bounded N. W. and N. by Canada, E. by New Brunswick, S. E. and S. by the Atlantic ocean, and W. by New Hampshire. As established by the treaty of Washington, the boundary on the E. is the St. Croix river and a line running due N. from a monument at its source to St. John river; on the N. the line follows the St. John and St. Francis rivers to a monument at the outlet of Lake Pohenagamook, and in the N. W. it follows the highlands from the said lake in a S. W. direction to the N. E. corner of New Hampshire. Maine is divided into 16 counties, viz.: Androscoggin, Aroostook, Cumberland, Franklin, Hancock, Kennebec, Knox, Lincoln, Oxford, Penobscot, Piscataquis, Sagadahoc, Somerset, Waldo, Washington, and York. The cities of Maine are Augusta, Bangor, Bath, Belfast, Biddeford, Calais, Gardiner, Hallowell, Portland, and Rockland; and the principal towns and villages are Camden, Eastport, Ellsworth, Frankfort, Kittery, Lewiston, Old Town, Saco, Thomaston, Waldoborough, Waterville, and Wiscasset. Augusta, Kennebec co., at the head of natural navigation on the Kennebec, is the seat of government.—The population of Maine, according to the federal enumerations, has been as follows:

| Date of Census. | White Persons. | Colored Persons. | Total Population. |
|-----------------|----------------|------------------|-------------------|
| 1790..... | 95,002 | 588 | 95,590 |
| 1800..... | 150,901 | 818 | 151,719 |
| 1810..... | 227,736 | 969 | 228,705 |
| 1820..... | 297,240 | 995 | 298,235 |
| 1830..... | 393,363 | 1,192 | 394,555 |
| 1840..... | 500,438 | 1,355 | 501,793 |
| 1850..... | 561,818 | 1,366 | 563,184 |

Decennial increase: 1790-1800, 57.16 per cent.; 1800-'10, 50.74; 1810-'20, 30.45; 1820-'30, 33.89; 1830-'40, 25.62; 1840-'50, 16.22. Ratio of population to the square mile in 1850, 18.36; to the total population of the United States, 2.51 per cent. Of the white population in 1850, 296,745 were males and 285,068 females; of the colored, 736 were males, 630 females, 895 blacks, and 461 mulattoes. Families, 103,837; dwellings, 95,802. Deaf and dumb, 266; blind, 198; insane, 561; idiotic, 577. Ages: under 1 year, 13,995; 1 and under 5, 61,781; 5 and under 10, 74,458; 10 and under 15, 71,743; 15 and under 20, 67,025; 20 and under 30, 99,995; 30 and under 40, 69,781; 40 and under 50, 53,355; 50 and under 60, 35,194; 60 and under 70, 20,782; 70 and under 80, 10,495; 80 and under 90, 3,455; 90 and under 100, 332; 100 and upward, 13; unknown, 820. Of the total population, 551,129 were native-born, 31,456 foreigners, and 584 of unknown origin. Of those born in the United

States, Maine furnished 517,117, Massachusetts 16,585, New Hampshire 18,509, Vermont 1,177, and New York 978; and of foreigners, Great Britain 16,412 (Ireland 18,871), British America 14,181, Germany 820, and France 148. Of the male population over 15 years of age (162,711), there were employed in commerce, trade, manufactures, mechanic arts, and mining, 88,247; in agriculture, 77,082; in labor not agricultural, 26,883; in the army, 114; in sea and river navigation, 15,649; in law, medicine, and divinity, 2,212; in other pursuits requiring education, 1,737; in government civil service, 419; in domestic service, 282; in other occupations, 196. The number employed in manufacturing establishments was, in 1820, 7,643; in 1840, 21,879; and in 1850, 28,078. Births in 1849-50, 13,995; marriages, 4,886; deaths, 7,582.—The coast extends in an E. N. E. direction, from Kittery point on the W. to Quoddy head on the E., about 278 m. in a straight line; but following its exact outline, and including the islands, the length of shore line is 2,486 m. It is studded with numerous islands, and indented by many bays and inlets, forming excellent harbors. The largest island is Mount Desert, having an area of 60,000 acres, and lying on the W. of Frenchman's bay. Its formation is very peculiar and its scenery picturesque and striking. Thirteen peaks, the highest variously estimated at from 1,480 to 2,800 feet high, rise from its surface from W. to N. Beside this, the principal islands are Isle au Haut, off the entrance of Penobscot bay, in which are Deer, Long, and Fox islands, and the Isles of Shoals, a group of 8 belonging partly to New Hampshire. Among the largest bays are Passamaquoddy, Machias, Pleasant, Frenchman's, Penobscot, Muscongus, Casco, and Saco. Maine is abundantly supplied with water courses. The Woolastock, flowing into the St. John on the N., and the Aroostock on the E., each with numerous tributaries, drain the N. portion of the state. The Penobscot, flowing into Penobscot bay, is the largest river, draining with its branches and connecting lakes the centre of the state, and navigable for large vessels to Bangor, 60 m. from its mouth. The Kennebec, W. of the Penobscot, affords great and valuable water power, and is navigable for ships to Bath, 12 m. from its mouth. Further W. are the Androscoggin and Saco. Several of the rivers have falls of considerable note. Scattered over the surface of the state are a great number of lakes, the largest of which is Moosehead, 85 m. long and from 4 to 12 m. wide; among others are Umbagog, Sebec, Chebecook, Schoodic, Baskahegan, Long, Portage, Eagle, Madawaska, Millikonet, and Sebago.—The surface is generally hilly, mostly level toward the coast, but rising in the interior. A broken chain of eminences, apparently an extension of the White mountains of New Hampshire, crosses the state from the W. to the N. E., terminating in Mars hill on the borders of New Brunswick. The highest elevation in the range is Mount Katahdin, more than 5 000 feet

above the level of the sea. Saddleback, Digelaw, Abraham, North and South Russell, and Haystack are among the others best known.—Maine is almost exclusively a region of the azoic rocks. The W. portion of the state is granitic, and numerous quarries of excellent granite are worked along the coast for the supply of cities in more southern states. Many of these quarries are directly accessible by ships. The metamorphic rocks abound in a great variety of interesting minerals, and some localities are famous among mineralogists, as Paris, Oxford co., for its beautiful colored tourmalines; Parsonsfield, York co., and Phippsburg, on the coast of Lincoln co., for varieties of garnet and various other minerals; Brunswick and Topsham for feldspar, &c.; and Bowdoinham for beryls. Over the surface of the country the drift formation is everywhere spread in the form of boulders and sand and gravel. Even upon the highest summits are found scattered rounded fragments of formations situated in places further N. Along the S. portion of the state deposits of tertiary clays are found in many localities beneath the drift. They are characterized by beds of shells of the common clam and mussel, and consequently belong to the newer pliocene. They extend into the interior as far as Augusta and Hallowell, and are penetrated by wells sunk 50 feet or more below the surface. Limestone quarries are worked in many places among the metamorphic rocks. Thomaston, at the mouth of Penobscot bay, has for many years furnished from its extensive quarries supplies of lime for a large portion of the Atlantic seaboard and the gulf of Mexico. (See LIME.) Argillaceous slates of excellent quality are worked for roofing slates at several towns on the Piscataquis, a branch of the Penobscot. Along the shore of Passamaquoddy bay are beds of red sandstone, probably of the age of the Connecticut river sandstone. It is penetrated by dikes of trap, and at the contact of the two rocks are developed many interesting minerals. On Campbell's island and on the shores of Cobscook bay veins of galena are found of some promise at the contact of trap dikes and argillaceous limestone. Trap abounds in this portion of the state, and in the interior it forms hills of considerable extent. The sources of the rivers are in a wild mountainous territory spreading over the central portion of the state. The mountains are in scattered groups, with no appearance of regular ranges. Their structure is of the metamorphic rocks; and so far as explored they present little of economical importance. On the Aroostock are numerous beds of limestone and one large body of red hematite. Another similar bed of this ore has been worked since 1848 at Woodstock, New Brunswick, near Houlton in Maine. Argillaceous slates and limestones prevail over the N. portion of the state. But few attempts have been made in Maine to work metallic ores. A blast furnace was run for some years with bog iron ores on the Piscataquis, and another was

in operation for a short time at Shapleigh in York co., working bog ores.—The climate is one of extremes. In the year the temperature ranges between 20° or 30° below to 100° above zero; and the isothermal lines vary with the latitude from 37° to 45½° F. At Fort Kent, at the mouth of Fish river on the St. John, lat. 47° 15', elevation 575 feet, the mean annual temperature of 1842-'5 was 37.04°; at Hancock Barracks (Houlton), lat. 46° 07', elevation 620 feet, 1829-'45, 40.51°; at Fort Sullivan (Eastport), lat. 44° 54', elevation 70 feet, 1822-'53, 43.02°; and at Fort Preble (Portland), lat. 43° 39', elevation 20 feet, 1824-'53, 45.22°. The mean temperature of the seasons was as follows:

| Localities. | Spring. | Summer. | Autumn. | Winter. |
|-----------------------|---------|---------|---------|---------|
| Fort Kent..... | 35.42° | 61.68° | 39.88° | 11.36° |
| Hancock Barracks..... | 39.15° | 63.33° | 43.15° | 16.41° |
| Fort Sullivan..... | 40.15° | 60.50° | 47.53° | 23.90° |
| Fort Preble..... | 42.77° | 65.64° | 48.16° | 24.70° |

The fall of rain at the several stations named above was annually 36.46, 36.97, 39.39, and 45.35 inches, and in the different seasons as follows:

| Localities. | Spring. | Summer. | Autumn. | Winter. |
|-----------------------|---------|---------|---------|---------|
| Fort Kent..... | 5.46 | 11.65 | 9.64 | 9.71 |
| Hancock Barracks..... | 7.62 | 11.92 | 9.95 | 7.43 |
| Fort Sullivan..... | 8.53 | 10.05 | 9.85 | 10.61 |
| Fort Preble..... | 13.11 | 10.38 | 11.98 | 10.96 |

The winters in Maine are severe, but the temperature is uniform and not subject to violent changes, and the climate is considered very favorable to health. The snow lies on the ground for from 8 to 5 months. The N. E. winds from the Atlantic in the spring and early summer charged with cold fogs are, if not unhealthy, at least unpleasant features in the climate of the state.—The soil varies greatly, being sterile in the mountains and fertile in the valleys; the most productive land lies between the Kennebec and Penobscot and in the valley of the St. John. Great forests cover the centre and N. portion of the state, yielding immense quantities of timber, which constitutes the principal source of wealth. The most prevalent trees are the pine, spruce, and hemlock; maple, birch, beech, and ash are common, and the butternut, poplar, elm, sassafras, and a variety of others are found in particular districts. Apple, pear, plum, and cherry trees thrive, but the peach has not been cultivated with success. The dense forests still afford retreats for the moose and caribou, fast disappearing to the more inaccessible regions. There are also the bear, deer, wolf, catamount, wolverene, beaver, marten, sable, weasel, raccoon, woodchuck, squirrel, &c. Wild geese and ducks, eagles, hawks, partridges, pigeons, owls, quails, crows, and humming birds are among the most common birds. The waters off the coast abound with fish, chiefly cod, herring, and mackerel; and salmon, trout, pickerel, &c., are found in great abundance in the lakes and rivers.—The industry of Maine is principally directed to lumbering,

ship building, and agriculture. The trees are felled in winter and dragged on the snow to the banks of the rivers, down which they are floated to the saw mills in the spring; and this occupation employs a great number of men. In ship building Maine ranks first among the states, and builds about a third of the whole tonnage. In 1850 the total tonnage built amounted to 91,212 tons; in 1859 to 40,905; but in 1855 it amounted to 215,904 tons. Bath, Waldoborough, Portland, Passamaquoddy, Belfast, Wiscasset, &c., are the chief ship building districts. In 1850 there were 2,039,596 acres of improved and 2,515,797 of unimproved lands in farms, of which there were 46,760; cash value of land, \$54,861,748; of agricultural implements and machinery, \$2,284,557; of live stock, \$9,705,726. In 1849-'50 the products consisted of 296,259 bushels of wheat, 102,916 of rye, 2,181,037 of oats, 1,750,056 of Indian corn, 151,731 of barley, 104,523 of buckwheat, and 3,436,040 of potatoes; hay, 755,889 tons; hops, 40,120 lbs.; clover seed 9,097, and other grass seed 9,214 bushels; peas and beans, 205,541 bushels; beeswax and honey, 189,618 lbs.; flaxseed, 580 bushels; flax, 17,081 lbs.; maple sugar 93,542 lbs., and molasses 3,167 galls.; silk cocoons, 252 lbs.; wine, 724 galls. In 1850 the live stock of the state consisted of 41,721 horses, 55 asses and mules, 133,556 milch cows, 83,898 working oxen, 125,890 other cattle, 451,577 sheep, and 54,598 swine; and the products of animals in the year preceding were 9,243,811 lbs. of butter, 2,423,454 of cheese, and 1,364,084 of wool. The average production of wheat to the acre was 10 bushels, rye 11, Indian corn 27, oats 20, potatoes 120, and barley 20. In relation to the total product of the United States, Maine produced of wheat 0.29, Indian corn 0.80, and wool 2.6 per cent. The value of home-made manufactures in 1850 was \$304,397; in 1840, \$513,599. The total value of agricultural products in 1840 was \$14,725,615, and in 1850 \$14,282,347.—In 1850 Maine contained a total of 3,977 manufacturing establishments, in which were employed a capital of \$14,700,452, and 28,078 persons, viz., 21,857 males, and 6,222 females. The raw material used was valued at \$13,555,806, and the cost of labor was \$7,502,916. The value of manufactured products was \$24,664,135; in 1830 it was \$7,043,773, and in 1840 \$18,244,504. Among the industrial establishments were 18 cotton mills, with a capital of \$3,329,700, employing 780 males and 2,959 females, and producing \$2,596,356; 36 woollen mills, capital \$467,600, employing 310 males and 314 females, and producing \$753,300; 26 iron works, capital \$364,000, with 313 hands, producing \$277,616; and 263 fisheries, capital \$496,910, hands 2,733, products \$569,376. In 1850 the exports of Maine amounted to \$1,556,912, and in 1859 to \$3,240,839; in 1855 they amounted to \$4,851,207. The imports in 1850 amounted to \$856,411, and in 1859 to \$2,157,086; in 1855 they were \$2,927,443. In 1850 and 1859 the shipping entered amounted to 143,186 and 179,651 tons, and that

cleared to 202,187 and 282,781 tons. In 1855 the entrances amounted to 199,178, and the clearances to 313,840 tons. The year 1859 was an unfavorable one for comparison, and hence the year 1855 is quoted. The shipping owned in the state in 1850 was 501,421 tons; in 1855, 806,604 tons; and in 1859, 739,886 tons. Of the total in 1859, 433,880 tons was registered, and 305,956 tons enrolled and licensed. Of a total tonnage of 747,406 in 1858, 224,657 was employed in the coasting trade, 56,841 in the cod fishery, and 11,056 in the mackerel fishery.—The principal railroads, with their length and cost, are as follows:

| Railroads. | Miles. | Cost. |
|-------------------------------------|--------|--------------|
| Androscoggin..... | 38.1 | \$645,371 |
| Androscoggin and Kennebec..... | 55.6 | 2,210,947 |
| Atlantic and St. Lawrence..... | 149.3 | 7,077,879 |
| Bangor, Old Town, and Milford..... | 12.8 | 175,282 |
| Baring and Lewey's Island..... | 17.3 | 310,000 |
| Boston and Maine (part)..... | 8.0 | 100,000 |
| Calais and Baring..... | 6.9 | 324,118 |
| Great Falls and South Berwick..... | 6.0 | 175,000 |
| Kennebec and Portland..... | 68.0 | 2,871,364 |
| Bath Branch..... | 9.5 | |
| Machiasport..... | 7.5 | 100,000 |
| Penobscot and Kennebec..... | 54.7 | 1,574,831 |
| Portland and Oxford Central..... | 21.5 | 430,000 |
| Portland, Saco, and Portsmouth..... | 51.2 | 1,500,000 |
| Somerset and Kennebec..... | 37.0 | 783,738 |
| York and Cumberland..... | 20.0 | 393,000 |
| Total..... | 547.4 | \$18,675,908 |

There are other lines in progress, as the European and North American, which will extend eastward from Bangor to and through New Brunswick, and to Halifax in Nova Scotia; the Penobscot railroad, &c. The principal towns are connected by lines of telegraph with the West and South, Newfoundland on the E. and Canada on the N., and with each other. Lines of steamers ply regularly between the larger cities and Boston. The total length of post routes in the state in 1858 was 4,866 m., of which 486 m. was by railroad, 2,279 by coach road, and 2,098 by roads not specified.—The number of banks in the state in 1850 was 82, and on Jan. 1, 1859, 68. The statistics of these institutions for the two periods was as follows: capital, \$3,248,000 and \$7,408,945; loans and discounts, \$5,830,230 and \$11,815,127; real estate, \$778,955 and \$145,565; specie, \$475,589 and \$668,754; all other assets \$966,390 and \$1,478,896; circulation, \$2,654,208 and \$3,886,539; deposits, \$1,223,671 and \$2,382,910; other liabilities, \$86,291 and \$179,353.—The government of Maine is founded on the constitution of 1820. Every adult male citizen of the United States, not a pauper or criminal, who has resided in the state 3 months, is entitled to vote at elections. The legislature is composed of a senate of 31 members and a house of representatives of 151 members, all elected annually by the people. The general election is held on the 2d Monday in September, and the legislature meets at Augusta on the 1st Wednesday in January annually. The governor (salary \$1,500) is also elected annually, and is assisted in his executive duties by a council of 7 members,

elected on joint ballot by the legislature. The secretary of state (salary \$900) and the state treasurer (salary \$1,600) are also elected by the same body and in the same way. The judiciary consists of a supreme judicial court, probate courts in the several counties, each with a judge and register, and municipal and police courts in the cities of the state. The supreme court is composed of a chief and 7 associate justices (salary of each \$1,800), the attorney-general (salary \$1,000), and a reporter of decisions (salary \$1,000); courts are held in 8 districts, denominated the western (Portland), middle (Augusta), and eastern (Bangor), for the purpose of hearing and determining questions of law and equity; all other cases are tried in the counties in which they originate. The total resources of the treasury in 1858 amounted to \$505,124, and the expenditures to \$456,701. The chief sources of income are direct taxes, the bank tax, sales of land, &c. On Dec. 31, 1858, the funded debt of the state was \$699,500, trust funds \$326,699.97, and debts due \$97,877.65; total liabilities, \$1,124,077.62. The value of taxable property in the state in 1850 was \$96,768,868, and in 1855 \$131,128,186.—In matters of public education, Maine ranks before all others of the United States. In 1850 one in every 8.1 of its population had attended school. The condition of the schools on June 1 of that year was as follows: 1, public schools 4,042, with 5,540 teachers, 193,815 scholars, and annual income \$315,436; 2, academies and private schools 181, with 232 teachers, 6,648 scholars, and income \$199,745; 3, colleges 3, with 21 teachers, 282 scholars, and income \$14,000. The number of persons over 20 years of age unable to read and write was 6,282. The public schools are supported from the proceeds of a permanent school fund, a tax of 1 per cent. on all bank capital, and by local town taxes. The school fund amounted in 1858 to \$149,065.48. In 1858 there were 4,521 public schools in the state, and the number of children between 4 and 21 was 240,739; scholars in summer schools, 132,182; in winter schools, 154,860; teachers, 2,828 male and 4,506 female. Amount raised for schools by taxes, \$402,761; received from the state \$82,698, and from local funds \$14,286; aggregate expended for school purposes, \$623,699. The collegiate establishments of Maine are: Bowdoin college at Brunswick, founded in 1794; Waterville college at Waterville, 1820; and the Maine medical school at Brunswick, 1820. There is also a theological seminary, under Congregational auspices, at Bangor. Bowdoin college has (1860) 14 professors, and its libraries amount to 30,000 volumes; Waterville college, 5 professors and 16,000 volumes; the medical school, 6 professors; and the theological seminary, 3 professors and 7,000 volumes. The number of churches in the state in 1850 was 945, with accommodations for 821,167 persons, and valued at \$1,725,845. Of the churches, 826 belonged to the Baptists, 199 to the Methodists, 180 to

the Congregationalists, 60 to the Universalists, 26 to the Friends, 15 to the Unitarians, 12 each to the Christians and Roman Catholics, 9 to the Episcopalians, 7 to the Presbyterians, 2 to the Swedenborgians, and 2 to other sects; and 78 were union and 22 free churches. The Baptist churches had accommodations for 101,889, the Congregational 70,623, the Methodist 59,421, and the union churches 23,527. The public press in 1850 comprised 49 separate publications, circulating annually 4,208,064 copies; of these, 4 (issuing 964,040 copies) were published daily, 5 (802,900) tri-weekly, 39 (2,906,124) weekly, and 1 (30,000) monthly; and 15 (987,246 copies) were literary and miscellaneous, 29 (2,501,680) political, 4 (438,568) religious, 1 (275,800) scientific. The number of libraries other than private in the state in the same year was 286, containing 121,969 volumes; of these, 77 (51,439 vols.) were public, 11 (2,225) school, 181 (26,988) Sunday school, 8 (89,625) college, and 9 (1,692) church libraries. Within the year ending June 1, 1850, the whole number of paupers supported in whole or part was 5,503, and the number then on the lists was 3,535; annual cost of support, \$151,664. The number of criminals convicted in the same year was 744, and the number in prison on June 1, 1850, was 100. The principal institutions supported in whole or part by the state are the insane asylum at Augusta, the state reform school at Cape Elizabeth, and the state prison at Thomaston.—Maine was visited in 1602 by Gosnold, in 1603 by Martin Pring, in 1604 by the French under De Monts (who wintered near the present site of Calais on the St. Croix, and in the following spring took possession of the shores of the Kennebec), and in 1605 by Capt. George Weymouth. In 1607 the Plymouth company, having obtained a grant which included this territory, sent out a colony under George Popham and Raleigh Gilbert, but it remained only one year. In 1613 a French colony fitted out by Mme. de Guercheville, a pious Catholic lady to whom had been transferred the patent of De Monts, landed at Mount Desert, with the purpose of founding a centre for missionary operations. The Virginia magistrates, however, sent an armed force which dispersed the emigrants and destroyed their settlement. In the following year Capt. John Smith arrived at Monhegan island, and went at once to the river Sagadahoc or Kennebec, where he trafficked profitably with the Indians, exploring the coasts, and compiling a short history of the country. Several unsuccessful attempts to plant colonies were made during the succeeding years under the auspices of the Plymouth company, no circumstance perhaps proving more disastrous to these enterprises than the treacherous and cruel treatment of the Indians by the whites. In 1620 Sir Ferdinando Gorges obtained a new patent from James I., granting to the Plymouth company all the country between lat. 40° and 48° N., including that upon which the pilgrims landed in the following December. Gorges regarded

these persons as intruders, and subsequently endeavored to oust them as well as the Massachusetts colony established under Winthrop at Charlestown and Boston. In 1621 the company transferred to William Alexander, afterward earl of Stirling, the country E. of the St. Croix (Nova Scotia), thus establishing the E. boundary of Maine as it now stands. Monhegan, the first or one of the first spots in Maine permanently peopled by Europeans, was settled in 1622, and Saco in 1623, or perhaps earlier. About 1629 the Plymouth company began to parcel out their territory in grants to suit applicants. In that year John Mason acquired the territory lying between the Merrimack and Piscataqua rivers, and called it New Hampshire, thereby settling the western boundary of Maine. In the course of 2 or 3 years the whole coast had thus been disposed of as far E. as the Penobscot. The country between the Penobscot and St. Croix, and even to the W. of the former river, was claimed by the French, and long remained a matter of dispute. In 1635 the Plymouth company, having resolved to give up its charter to the government, redi-vided the territory among its members, Gorges taking the whole region between the Piscataqua and the Kennebec, of which he subsequently (1639) received a formal charter from Charles I. under the title of the province of Maine. Several derivations are assigned for this name, the commonest opinion being that it was given in compliment to Queen Henrietta Maria of England, who it has been said owned the province of Maine in France. The province of Maine, however, then belonged to the crown of France, nor has it been ascertained that Henrietta Maria ever had any interest in it. Gorges was now appointed governor-general of New England with almost unlimited powers. (See GORGES.) His son Thomas was sent over as deputy in 1640, and established himself at Agamenticus, now York, where in 1642 arose a city called Gorgeana. On the death of Sir Ferdinando, Maine descended to his heirs. It was now really placed under 4 different jurisdictions: 1, that of Gorges, extending from the W. line to Kennebunk; 2, that of Rigby, from Kennebunk to the borders of the Kennebec valley, held under grant from Sir Ferdinando; 3, the Sagadahoc, from the Kennebec to the Penobscot; 4, the French (Acadia), from the Penobscot to the St. Croix. Massachusetts, apprehending lest these fragmentary and unsettled governments should fall into hands hostile to her interests, and stimulated by the wishes of many of the inhabitants, set up (1651) a claim under her charter to the province of Maine, and sent commissioners to admit the people of Gorges's and Rigby's grants into the jurisdiction of the Bay colony. The governments of Gorges and Rigby remonstrated, and carried the matter before the English parliament; but the Puritan party was now in the ascendancy at home, and the claims of the Puritan colony of Massachusetts were heard with more favor

than the protests of zealous adherents of the king and the established church. In 1653, 150 freemen in 5 other towns took the oath of allegiance to Massachusetts, which continued to exercise its authority in such a way as to prove that, however slight its claim to jurisdiction, the transfer was equally beneficial to both parties. The towns were governed in local matters nearly as they are now, and the rules of church discipline were less strict than in some other colonies, the people being generally favorable to religious freedom. No acts of persecution stain their history, and they frequently afforded an asylum to fugitives from intolerance in other parts. In 1658 Cromwell annulled the transfer of Acadia to France, which had been effected in 1632, and sent out Sir Thomas Temple as governor. He retained his post until 1669, when Acadia reverted to France in accordance with the treaty of Breda. In the mean time the Stuarts had been recalled to the throne of England, and the heirs of Gorges petitioned for the restoration of their territory in Maine. Royal commissioners were accordingly sent by Charles II. in 1664 to reestablish the authority of the grantees. Massachusetts resisted, and a conflict of jurisdictions ensued, which was terminated in 1677 by Massachusetts purchasing the interests of the claimants for £1,250 sterling. Two years before this the first Indian war in Maine was begun by King Philip, at whose instigation a series of unprovoked attacks were made upon the settlers, and over 100 white persons were massacred in the space of 3 months. Thenceforth the savages held the country in terror until 1760. Towns were plundered and burned; every twentieth settler was slain or carried into captivity, and many of them removed to more protected colonies. Meanwhile disputes were excited by the claims of the duke of York, who, under a grant from Charles II. of the Dutch territories in North America, professed to hold all that part of Maine lying between the Kennebec and St. Croix rivers. Sir Edmund Andros was commissioned as governor of the duke's territories in New York and Maine; but Massachusetts, having caused a new survey of the E. limit of her patent to be made, under which she pushed her boundary forward to the W. shore of Penobscot bay, continued to hold possession of all the colony except Sagadahoc and Pemaquid. When the duke came to the throne as James II., Andros was made governor of New England, and visited Maine, where he was guilty of great extortion. The Massachusetts charter had already been declared forfeit. The revolution of 1688, however, restored things to their former state, and thenceforth the history of the colony of Maine is merged in that of Massachusetts. From the close of Indian hostilities Maine began to make steady progress in civilization and wealth. The war of the revolution affected her but little, but during that of 1812 she was again exposed to the horrors of frontier struggles. The British obtained possession of a part of the

country, and kept it until the conclusion of peace. The final separation of Maine from her sister colony took place March 15, 1820, when she was admitted into the Union as an independent state. Ever since the treaty of 1783 a dispute existed between the governments of the United States and Great Britain as to the proper interpretation of that treaty so far as it related to the boundary between Maine and the British possessions. This controversy, which had at length created much excitement and ill feeling among the population in the neighborhood of the territory in dispute, and was endangering the peace between the two countries, was finally settled in a satisfactory manner by the treaty of Washington in 1842, by which Maine and the United States agreed to cede to Great Britain a small portion of the territory claimed by her, in return for the concession of Rouse's Point and the free navigation of the river St. John.

MAINE, an ancient province of France, and with Perche one of the great military governments of the kingdom, bounded N. by Normandy, E. by Perche and Orléannais, S. by Anjou and part of Touraine, and W. by Brittany. It is now included in the departments of Mayenne and Sarthe. Its capital was Le Mans.

MAINE-ET-LOIRE, a N. W. department of France, bounded N. by the departments of Mayenne and Sarthe, E. by Indre-et-Loire, S. E. by Vienne, S. by Deux-Sèvres, S. W. by La Vendée, and W. by Loire-Inférieure; area, 2,775 sq. m.; pop. in 1856, 524,887. It belongs to the basin of the Loire, by which it is annually inundated; the principal other rivers are the Maine, Loir, Sarthe, Mayenne, and Oudon. The surface is almost level, with slight undulations, and the soil very fertile, producing grain, wine, and fruits. Iron is found, and slate quarries are extensively worked. It has excellent breeds of cattle and horses; the forests abound in game, and the streams in fish. The principal manufactures are of linen, especially table linen and handkerchiefs, flannels, and cotton. It has a considerable trade in grain, wine, brandy, and cattle. Annual value of manufactured products \$5,466,080. Capital, Angers.

MAINE DE BIRAN, FRANÇOIS PIERRE GONTHER, a French metaphysician, born at Grateloup, near Bergerac, department of Dordogne, Nov. 29, 1766, died July 16, 1824. He entered the body guard of Louis XVI., and was at Versailles during the tumults of Oct. 5 and 6, 1789, but escaped from the dangers of the revolution by retiring to his estate near Bergerac. There he began in solitude those philosophical reflections which have gained him the reputation of one of the most original and profound of French psychologists. In 1797 he was chosen to the council of 500, from which he was excluded on suspicion of royalism; in 1809 he became a member of the legislative body; and in 1813 he was one of the commission appointed to draw up an address to the emperor, which for the first time manifested a decided opposition to his policy. After the restoration he

was reflected to the chamber of deputies, became a councillor of state in 1816, and from 1818 retained his seat in the legislature, in which he constantly maintained the prerogatives of the crown. In a memoir entitled *Influence de l'habitude sur la faculté de penser*, which obtained the prize of the institute in 1803, he prepared for his departure from the reigning philosophy of Condillac by maintaining a distinction between active and passive mental habits, according to which the mind is active in perception and passive in mere sensation. As he grounded all the faculties upon the senses, this work was received with favor by the ideologists, and the author who was to lead the reaction of French thought against the sensational school thus began with a success obtained under its auspices. In his second memoir, *Sur la décomposition de la pensée* (1805), he abandoned the effort to give a physiological origin to thought, suggested that sensation could not furnish the active and motive element in man, and was disposed to admit a principle of intelligence distinct from the organism. This work was rapidly followed by others, the most important of which was the *Examen des leçons de M. de Laromiguière* (1817), in which he completely passes from sensational to spiritual philosophy, and develops his own system, which caused Royer-Collard to say of him: "He is the master of us all." His fundamental doctrine relates to the will, which he regards as a distinct motive force, a faculty raised above the others, constituting the person himself. He conceives of personality as a force, not as a substance, and maintains that the substitution of the idea of the latter for that of the former with respect to man and the universe has often led philosophy into pantheism, since force is the only principle of life and individuality. This individual force appears in union with an organic resistance, from which it is inseparable; and any system, therefore, which tends toward absolute unity contradicts the primitive conditions of our being. The processes of the mind are but manifestations of will, which furnishes the universal and necessary notions of causality, unity, and liberty. He applies his doctrine to nature, maintaining that every efficient cause in the order of the world is an immaterial force. All beings, he says, are forces, and all forces beings; nothing really exists except as a force, as a veritable living substance. Thus, he adds, profound and consistent thinkers have been led to spiritualize the world, as Leibnitz did; to admit no reality but that of simple beings, whose whole essence is active force. This result of his system appears especially in the article on Leibnitz which he furnished to the *Biographie universelle*, in which psychology passes into ontology, and the doctrine of monads or simple active principles is accepted as the law of the universe. The style of Maine de Biran is unsurpassed in obscurity and difficult involution by that of any French philosopher, and presents a striking contrast with the grace-

ful writings of his opponent Laromiguière. It is however pregnant with meaning, and Cousin styles him indisputably the most original of all his French masters. A complete edition of his works was edited by Cousin (4 vols., Paris, 1841).—See Naville, *Maine de Biran, sa vie et ses pensées* (Paris, 1857).

MAINTENON, FRANÇOISE D'AUBIGNÉ, marchioness, second wife of Louis XIV. of France, born at Niort, Nov. 27, 1635, died at St. Cyr, April 15, 1719. Her birthplace was a prison, Château-Trompette, where her father, Constant d'Aubigné, baron of Surimeau, was confined for having killed his first wife and her lover, whom he had taken in adultery. The mother of Françoise was the daughter of the governor of the prison, whom D'Aubigné had persuaded to marry him secretly. In 1639 he was discharged from prison, and with his wife and children emigrated to Martinique, where he died in the utmost poverty. His widow returned to France, whither she was soon followed by her daughter, who, after various vicissitudes and much suffering from poverty and ill treatment on the part of her relatives, found herself at the age of 15 in Paris, an inmate, in a dependent and almost menial position, of the house of her godmother, the countess de Neuillant, who had converted her from Calvinism to Catholicism. The comic poet Scarron, who was paralytic and a cripple, lived in the same street with the countess de Neuillant, became interested in the young, beautiful, and intelligent girl, whose adventures had been related to him, and furnished money to enable her to enter a convent, which poverty had hitherto prevented her from doing. Françoise called to thank her benefactor, and at their first interview he proposed to her to become his wife. After a week's deliberation she consented, and they were married in 1651. She was at this time exceedingly beautiful, graceful, and witty, and the house of Scarron soon became the resort of the most brilliant intellects of Paris. Scarron died Oct. 14, 1660, leaving his young widow nearly penniless, his pension ceasing at his death. Mme. Scarron remained at court petitioning for the reversion of her husband's pension with small hope of success, till Mme. de Montespan, the king's mistress, hearing of her destitution, interfered in her behalf, procured her an annual allowance of 2,000 francs, and somewhat later made her the governess of the children she had had by Louis, much to the dissatisfaction of the king, who at first did not like the extreme gravity and reserve of the young widow. Her talents and wisdom, however, soon attracted his attention, and she became his confidant and adviser, was made a marchioness, and took the name of Maintenon from an estate, and after having resolutely refused to become the king's mistress became his wife by a secret marriage in 1685 or 1686, at which time he was 48 and she 50 years of age. From this time till his death Louis was greatly under her influence, though her power over him was exercised with extreme prudence

and moderation. She carefully shunned the appearance of meddling with affairs of state, though in reality nothing was done without her knowledge and consent. It was at her instigation that the edict of Nantes was revoked and the Protestants persecuted. After the death of the king, in 1715, she retired to the convent and seminary of St. Oyr, which she had herself founded, where she spent the rest of her life in acts of charity and in devotional exercises, which from earliest youth she had been accustomed scrupulously to observe.—See *Madame de Maintenon peinte par elle-même* (Paris, 1820), which contains her letters, and *Histoire de Mme. de Maintenon*, by the duke de Noailles (2 vols. 8vo., Paris, 1848).

MAINZ. See MENTZ.

MAISTRE, JOSEPH, count de, an Italian statesman and author, born in Chambéry, April 1, 1753, died in Turin, Feb. 25, 1821. His father was president of the senate of Savoy. After having studied at the university of Turin, he entered the magistracy in 1775, and became a member of the senate in 1787. The invasion of Savoy by the French in 1798 obliged him to retire to Turin; and in 1798, when the king had to give up his possessions on the continent, De Maistre followed him to the island of Sardinia, where he was appointed grand chancellor. This office he retained until 1803, when he was sent as ambassador to St. Petersburg. He remained at the Russian court for 14 years, and wielded for some time a considerable influence over the czar Alexander. On his return to Turin (1817) he was appointed minister of state and regent of the grand chancery. He commenced his literary career with an *Éloge du roi Victor Amédée*. In a speech made at the opening of the senate in 1784 he remarked: "Our age has distinguished itself by a destructive spirit which has spared nothing, neither laws, customs, nor political institutions; it has attacked all, shaken all, and the devastation will extend to limits which no one can as yet foresee." The outbreak of the French revolution caused these words to appear prophetic, and increased the reputation of the author in the literary and religious world. He wrote several works against the revolutionary party in France, among which his *Considérations sur la France* (1794) had the greatest circulation. Notwithstanding the strictest prohibition, 8 editions of it appeared in Paris in one year. In 1810 he published at St. Petersburg an *Essai sur le principe générateur des constitutions politiques et des autres institutions humaines*, the object of which was to show that God is the immediate source of all authority upon earth, and every attack upon religion is a prelude to the destruction of social and political order. A translation of a work of Plutarch, *Sur les délais de la justice divine dans la punition des coupables*, with notes, appeared at Lyons in 1816. His most celebrated work is that *Du pape* (Lyons, 1819). It treats of the pope from four points of view, viz.: 1, in his relation to the Catholic church; 2, to tem-

poral sovereignties; 3, to the civilization and happiness of the nations; 4, to the schismatic churches. It is considered as one of the standard Catholic works in favor of the infallibility of the holy see, which it infers from the necessity of an infallible authority in the spiritual order. Infallibility in the spiritual order is declared as synonymous with sovereignty in the temporal order. From the same standpoint he attacked the Gallicans in the work *De l'église Gallicane dans son rapport avec le souverain pontife, pour servir de suite à l'ouvrage intitulé: Du Pape* (Lyons, 1822). Among his other works are: *Lettre d'un gentilhomme Russe sur l'inquisition Espagnole* (Paris, 1822), and the *Soirées de St. Pétersbourg, ou entretiens sur le gouvernement temporel de la providence* (2 vols., Paris, 1821), in which the justness of war and capital punishment is strongly advocated. In his posthumous *Traité de la philosophie de Bacon* (Paris, 1836) he depreciates the English philosopher, and disparages critical philosophy in general. A very lively discussion was called forth by the publication of another posthumous work, *Mémoires politiques et correspondance diplomatique de Joseph de Maistre, avec explications et commentaires historiques*, by Albert Blanc (Paris, 1858), many passages in which seemed not fully to agree with his other writings. But like his previous works, it showed him full of expectation of an entirely new political and social order of things, when all states of the world should be closely united, with the pope as president; an idea which has since been developed by a school of Catholic writers, and was even made use of, though for a very different purpose, by Gioberti in his work *Del primato d'Italia*.—XAVIER, count de, an Italian author, brother of the preceding, born in Chambéry, Savoy, in 1764, died in St. Petersburg, June 12, 1852. In early life he entered the military service of Sardinia, but upon the conquest of the country by the French he emigrated to Russia, supported himself for some time by his pencil, and entering the Russian military service participated in the war against Persia, in which he attained the rank of major-general. He subsequently established himself in St. Petersburg, and devoted the remainder of his life to literary and scientific pursuits. In 1794, being then known as a chemist and as a landscape painter, he produced an ingenious philosophical trifle, entitled *Voyage autour de ma chambre*, which had great popularity, and of which numerous imitations of various degrees of merit subsequently appeared. In 1811 appeared his *Lépreux de la vallée d'Aoste* (translated into English, Philadelphia, 1826), a work founded on fact, and not less creditable to the author's literary capacity than to his humanity. It was followed by the *Prisonnier du Caucase*, and *Pras-covie, ou la jeune Sibérienne* (translated into English, Philadelphia, 1826), both containing vivid and truthful pictures of scenery and manners in the eastern and southern provinces of the Russian empire. A complete edition of his

works was published in Paris in 1825, in 3 vols. 18mo.

MAITLAND, SIR RICHARD, a Scottish lawyer and poet, born in 1496, died March 20, 1586. He held for a time the office of lord privy seal, and was the author of a "History and Chronicle of the House of Seaton," and of several poems, the most important of which is that on "The Creation and Paradyce Lost." A complete edition of his poems was first published by the Maitland club in 1880. He is celebrated as a collector of ancient Scottish poetry. His collections are yet extant in manuscript in the Pepysian library, Cambridge, and fill 2 large volumes.

MAIZE, or INDIAN CORN, a valuable grain, a native, according to De Candolle and the most eminent botanists, of South America. It belongs to the natural order *gramineæ*, and is a monocœious grass. Linnæus adopted the word as the specific name of his genus *zea* (Gr. *ζαα*, to live; *ζ. α.*, affording sustenance to animals), and its scientific nomenclature is *zea mays*. Bonafous, however, after some previous writers, in his *Histoire naturelle, agricole et économique du maïs* (Paris and Turin, 1888), attributes to it an eastern origin, in accordance with an old idea entertained respecting many other tropical American vegetables. There can be little doubt that this is entirely erroneous; and neither any antique works of sculpture, nor any mention in ancient writers, have been found, where it is represented as a cereal grain. Climate and long cultivation seem to have had such effects that the most marked variations have arisen, which have been considered distinct species. Stendel mentions as many as 7, though he is willing to allow that they may be varieties of one common species. A singular form, in which each seed or kernel is wrapped in a chaffy husk, is considered by A. de St. Hilaire as the primitive type; and this sort is said to grow spontaneously in the moist forests of Paraguay. It appears to have been known to Bonafous, and may be his *Z. cryptoperma*, made specifically distinct from *Z. mays*; but there is an impression that after 2 or 3 years' cultivation the chaffy glumes disappear and the kernels become bare as in ordinary maize. If this condition is effected by a gradual change of climate, thus seemingly fitting the plant for a more humid atmosphere, it cannot be considered the typical form. Kernels of maize taken from the mounds in Peru are in form like those of the variety called gourd-seed corn, thus seeming to indicate that the southern variety, with thin, elongated, and flattened seeds, approximates more nearly to the original character than do the northern field sorts, which are blunter and shorter. It is likewise claimed that Columbus found the maize in cultivation when he first landed at Cuba; and the early visitors from Europe witnessed its cultivation in other parts of America. In 1608 the colonists at James river successfully raised large crops of maize, imitating with little variations the culture practised there by the aborigines. In 1621 the pilgrims at Plymouth found this grain

the field vegetable of the Indian tribes, and extensively raised by them for food. This remarkable inclination to accommodate itself to circumstances of climate, by producing distinct varieties, renders the maize a most valuable agricultural plant. Some of the larger varieties assume the habit and port of the tallest growing annuals; while, on the other extreme, there are sorts of the dwarfiest proportions, scarcely exceeding the size of some of the common grasses. A few years ago the so called tree corn was brought from China, of extraordinary height in growth; and the well known Canada corn, which matures in a few weeks' time, and which is about 2 feet in height, may be cited for the opposite illustration. The early Mandan corn (*Z. m.*, var. *præcox*, Nuttall) has a very low stem, and is successfully cultivated by the aborigines on the Missouri to its sources, ripening in a climate where no other variety could exist. An early ripening variety is known as the quarantain or 40 days maize, originating in Hungary and introduced into England from France. The geographical area which is favorable to maize is in America from lat. 40° S. to 54° N.; and in the eastern hemisphere it extends from the Azores to the southern part of Europe, being raised to a certain extent even in Asia Minor, Egypt, Hindostan, and China; so that, with the exception of rice, it is perhaps the most widely cultivated grain in the world. In the warmest parts of the torrid zone, 3 crops can be secured in a season; and in the colder portions of its range, 2 or 3 months are allowed for the maturation of its seed. The variety known as Canada corn is of this character, and is one of the most important to the farmer; 75 bushels of it to the acre have been raised upon the exposed promontory of Nahant, Mass. The kinds of field corn most valued in New England are the large yellow, of which a superior variety is the King Philip, and the red, which is only a colored variety of the former. The sweet corn is principally grown for the table, and its green stalks are used for feeding cattle. The Tuscarora, abounding in starch grains, and some other early white-kernelled sorts, are likewise planted to supply the table with boiled ears; but the most delicious are the wrinkled kernelled sweet corns. Some very excellent hybrid forms have been produced by using the southern farinaceous varieties as the parent stock for impregnation with the pollen of the sweet corn. The white gourd-seed corn is recommended for hominy and cakes, and the golden yellow gourd-seed as best adapted to southern and western cultivation.—There are the greatest differences in the proportions of farinaceous and other matters in the different varieties. It would seem as if the amylaceous kinds were intended for more southern latitudes, and the sorts abounding in oil better suited to northern aspects. The most starch is found in the Tuscarora. The rice or pop corn abounds in oil. This oily principle is easily seen in the form of fixed oil dots lodged in the cellular tissue of the seed, by taking a thin longitudinal

section and submitting it to a high magnifying power; by touching the slide on which the section lies with a solution of iodine, the starch will be colored violet, while the oily parts will remain uncolored. It is this closer and albuminous-oily structure in some kinds of maize which renders the kernel so compact and hard, and which on bursting with heat causes the popping or inversion of the contents of the grain, which cannot be effected in the farinaceous kinds. These harder seeded varieties are sometimes called flint corn, and are unfit for dry feed; but the sweetest and longest keeping meal is procured from them. Abundance of illuminating oil is also extracted from such corn. The amount of nutritive matter afforded by maize is said to be inferior only to wheat and rice. The preponderant amount of the phosphates in some particular varieties renders them valuable for fattening cattle, swine, and poultry, though perhaps too exciting for human food. The flint corn, on the contrary, is better suited for the latter purpose, and does not exhaust the soil nearly as much. All the sorts of Indian corn require however light, rich, stimulating soils; and hot weather and frequent showers are favorable to its growth. Droughts, unless too long continued, affect it less than might be expected; and it has been often noticed that showers falling after weather so hot and dry as to curl the leaves, will restore them to verdure and vigor.—The contour of a full-grown maize plant is beautiful, and partakes of the style of tropical vegetation. In well tilled lands, the foliage is large, the leaves are numerous and dark green, the internodes of the stems clean and bright, and the joints defined and prominent. Numerous aerial roots tinted with various colors project from the lower parts of the stem, which, if undisturbed, find their way into the surface soil, and serve as supports or cables to sustain the growing stalks. Hence the latest mode of raising Indian corn is to avoid hilling or drawing the earth into conical heaps about the stems; on the other hand, care is taken merely to keep the soil well hoed, loose, and free from weeds. The disposition to avail itself of food is seen in scarcely any other field crop to so remarkable a degree as in the Indian corn; and highly stimulating manures render apparent their service throughout the season. Certain kinds of seaweeds, as kelp, have also been found serviceable; but they should be spread evenly over the ground and then ploughed in.—See an "Essay on the History and Importance of Indian Corn as an Agricultural Product," by O. L. Flint, in the "Transactions of the Essex Agricultural Society" for 1846. Valuable statistical tables of the corn crop in the United States can be found in the patent office reports for 1853 ("Agriculture," p. 101); and many historical items of much interest are embodied in a paper in the "Transactions of the Illinois State Agricultural Society" for 1856-'7.

MAJESTY, a title of the highest honor, first used by the Romans to designate the supreme

power and dignity of the people (*majestas populi Romani*), as well as of its highest chosen representatives or rulers, as dictators, consuls, and the senate. On the overthrow of the republic, the emperors assumed the same title (*majestas Augusti*), and after them it was adopted by the emperors of the West. Of kings, Louis XI. of France and Henry VIII. of England assumed it first. It is now generally bestowed on all emperors and kings of Europe, except the sultan, who is styled highness, as well as on the emperor of Brazil. The official title of the emperor of Austria is imperial royal majesty. He has also, as king of Hungary, the title of apostolic majesty, which was bestowed on St. Stephen, the first Hungarian king, by Pope Sylvester II. (1000). At a later period the titles of Catholic majesty, most Christian majesty, and most faithful majesty were bestowed by the see of Rome on the kings of Spain and France respectively. Sebastian III. of Portugal first received it from Philip II. of Spain. Violations of the majesty of the people, as for instance treason, were termed by the Romans *crimina læsæ majestatis*, a term also used of violations of monarchical dignity.

MAJOR, in music, a term applied to imperfect concords, but chiefly to the interval of the third. It also denotes that one of the 2 modern modes in which the third is 4 semitones above the tonic or key note.—In military science, the major is a field officer ranking next below a lieutenant-colonel and above a captain. He has generally the command of a battalion, the exercises of which he superintends, and in action or on parade carries into effect the orders of his superior officer. In the U. S. service each regiment of artillery, cavalry, and infantry has 2 majors; those of engineers and topographical engineers have 8 each. In the military services of European countries the number of majors in a regiment is regulated by that of the battalions. The term does not occur however in the artillery or engineers in the British army, and in the French service it has been superseded by that of *chef de bataillon*. This class of field officers does not appear to have existed before the 17th century. A brigade major is an officer who performs for a brigade, or in garrison, the duties ordinarily discharged by a major in a regiment or battalion. A major-general ranks next below a lieutenant-general, and is the highest grade in the United States army, that of lieutenant-general, which has been conferred in two instances only, being of an exceptional character. In the British service the major-general is the lowest general officer. In other cases, the term major, when applied as an epithet to the several denominations of men in an army, signifies the superior of the department; as sergeant major, the chief non-commissioned officer in a regiment, who assists the adjutant; drum major, the chief of the drum corps, &c.

MAJORCA (Sp. *Mallorca*), the largest of the Balearic islands, in the Mediterranean, belonging to Spain, situated about 120 m. S. from

Barcelona, between lat. $39^{\circ} 20'$ and $39^{\circ} 57'$ N., and long. $2^{\circ} 20'$ and $8^{\circ} 30'$ E.; length from E. to W. nearly 60 m.; breadth in some parts 40 m.; area, 1,400 sq. m.; pop. in 1857 about 200,000. The northern half of the island is covered by mountains, the highest of which is 5,114 feet above the sea. The southern half is comparatively level. The rocks are generally of secondary or tertiary formation. There are only two rivers, both of them small, and there is a general want of water. The climate is temperate, the thermometer in summer ranging only from 84° to 88° , while that of winter seldom falls below 48° . The island produces marbles of great beauty and variety, and also slate and plaster. Lavender, rosemary, thyme, marjoram, marsh mallow, jonquil, and wild celery are the commonest vegetable productions. Mules abound, and are the only beasts of burden and of draught. The sheep are large, and produce great quantities of fine wool. Game of the smaller kind, such as hares, rabbits, quails, and partridges, is very plentiful. There are scarcely any venomous animals. The soil is exceedingly fertile, and though the agricultural skill of the islanders is imperfect, the annual product is estimated at \$3,000,000. The olive crop yields yearly 650,000 gallons of oil. The people manufacture a considerable quantity of woollen stuffs, not only for their own use, but for export to Spain, Malta, Sardinia, and America. They derive a large profit from inlaid work, which they make with much skill. Their wines are excellent, and are largely exported. The island contains two cities, Palma and Alcedia, and many villages. Palma is the capital and the seat of a bishop. The natives resemble the Spaniards, and particularly the Catalans, in their appearance and manners. The upper classes speak Castilian, but the lower orders use a dialect which is a mixture of Greek, Latin, Arabic, Catalanian, Languedocian, and Vandal words. The people make excellent soldiers and sailors, and are remarkably honest and hospitable. (See BALEARIC ISLANDS.)

MAKI. See LEMUR.

MALABAR, a province of British India, in the presidency of Madras, on the W. coast of Hindostan, between lat. $12^{\circ} 2'$ and $10^{\circ} 38'$ N.; area, 6,000 sq. m.; pop. in 1854, 1,514,909. It is bounded N. by the province of Canara, S. by the semi-independent territory of the rajah of Cochin, W. by the Indian ocean, and E. by the chain of the Western Ghats, varying from 4,000 to 7,000 feet in height, between which and the sea the country lies, extending about 150 m. along the coast, with an average breadth of 40 m. With trifling exceptions, a low sandy strip, from 1 to 8 m. broad, runs along the shore, and is covered with a continuous and luxuriant grove of cocoanut trees, to the cultivation and care of which the natives give the greatest attention. Behind this tract, hills of inconsiderable height come down from the mountain chain which forms the E. boundary. Between these hills there are valleys of extreme fertility, being the

receptacles of the soil washed in the course of ages by the heavy rains of this region from the surrounding eminences. The hills have level, or rather perfectly horizontal summits of naked rock, which is here a peculiar characteristic of the face of the country. Many of them have steep sides, which are not unfrequently formed into terraces and cultivated. All the country that borders on the Ghats is covered with forests and dense jungle, belts and detached portions of which in places stretch to within a few miles of the sea. Malabar is watered by innumerable streams, but all of them have necessarily very short courses. The chief river is the Beypoor, which has 9 feet water on the bar, and is with its tributaries navigable for boats of considerable size for about 30 m. inland; next to this is the Ponany river, which has a longer course, but much less depth of water. Several inlets of the sea run along a short distance from the shore parallel to the coast, receive the mountain streams, and communicate with the ocean by shallow channels, and are navigable for small boats for nearly the whole length of the province. It is on the banks of the rivers and of these inlets, in the valleys, and along the coast, that the inhabitants reside. The climate is, on the whole, healthful, though in the interior jungle fever is prevalent at certain seasons of the year. The hot season is from February to May, the wet from May to October, and the cool during the remainder of the year. The thermometer seldom rises above 90° in the shade, and rarely falls below 70° . During the wet season very heavy rain falls along the coast, increasing toward the interior; and at Wallaghaut on the face of the Neilgherries, about 2,500 feet above the sea level, 821 inches were registered in one year.—The principal vegetable productions are pepper, cocoanuts, ginger, coffee, hemp, cardamoms, betel nuts, turmeric, arrow root, sapan wood, sandal wood, timber of different sorts, and various gums and resins. Teak and 120 other kinds of valuable timber have been enumerated in a report upon the forests of Malabar. Cardamoms are produced from the forest land on the face of the mountains which bound the province, at the height of from 2,000 to 4,000 feet above the sea. From certain indications those who follow the business know where to fell the timber, which they afterward burn, and the following year a crop of cardamoms springs up spontaneously. Pepper is chiefly cultivated in the northern part of Malabar, in the neighborhood of Telicherry. The trailing plant from which it is produced requires but slight care, the cultivator having little more to do than collect the produce. It is only of late years that coffee has been grown to any considerable extent in this district, and the cultivation is entirely the result of the enterprise of British planters. The estates are situated on the slopes of the mountains, some 2,000 feet above the sea, where the land is of little value to the natives, and where the malaria which causes jun-

gle fever lower down does not ascend. Ground is easily acquired, either from the government or native land owners; the capital embarked is small, and as the rate of wages for laborers is only from 6 to 10 cents a day, the profits derived by the proprietors of coffee estates are proportionally large. Rice is grown throughout the province, but not in sufficient quantities for internal consumption. The cultivation of ginger, since it has been exported to Europe, has been carried on with great vigor. Rich iron ore is found in many places, and gold in small quantities; there is no limestone in Malabar. Large herds of elephants and bison frequent the interior forests. There are some tigers and numerous species of the leopard, deer of various kinds, elk, bears, hogs, porcupines, squirrels, apes, and monkeys. In the most secluded recesses of the mountains there is said to be a creature of the ox kind, called the *gayal*, 10 feet high and large in proportion, with beautiful horns and a hide of a silver gray color. There are small bullocks, which, together with buffaloes, are used in tilling the ground; there are but few horses, and traffic is either carried on by water or upon men's shoulders, as in China.—The population of Malabar is made up of Hindoos, Mohammedans, and Christians. As in the other parts of India, the highest class of Hindoos are the Brahmins, who are here called Namburis, and who to limit the numbers of their race prevent the younger sons from marrying. There is another cast of Brahmins called Puttar, who are much more numerous than the Namburis. The next in rank are the Nairs, who are of 11 castes, of various ranks and professions, but all pretend to be born soldiers. Their habits and manners are marked by some strange peculiarities, among which may be mentioned the want of that peevish disposition natural to other Hindoos, and their utter disuse of marriage. A girl on reaching the age of puberty forms any connection she thinks fit; and the children, who have no claim upon their natural father, become the heirs of her brothers. The Tiars, or Theans, are considered next in rank to the Nairs, and are engaged in various occupations, but principally in cultivating the ground. The Poliars, or Ohermars, are a numerous class, who, before the British interfered in their behalf, were held in slavery, and bought and sold separately or along with the land. The Niadis are the lowest specimens of all, and are outcasts considered so impure that even a Cheramar would be defiled by their touch. They wander about in companies of 10 or 12, keeping at a little distance from the roads, and upon seeing a traveller set up a cry for assistance. They refuse all labor, subsist upon roots and any food however loathsome, and live in wretched huts built in secluded spots. The Ohermars and Niadis are supposed to be the descendants of the aboriginal inhabitants of the country, and are much smaller in stature and darker in complexion than the Brahmins, Nairs, or Tiars, who are all of good height and well formed, with remarkably hand-

some features and olive-colored complexion. The native Mussulmans, denominated Mapilas, form about one fourth of the population. They are descended from Hindoo mothers by Arab fathers, who settled in Malabar about the 7th or 8th century, and are exceedingly fanatical and treacherous. There are some Syrian Christians toward the S. boundary of the province, who consider themselves descendants of converts made by the apostle St. Thomas in the 1st century (see CHRISTIANS OF ST. THOMAS); and also a few thousand converts to Christianity and descendants of the Portuguese, who reside chiefly in the neighborhood of their ancient settlements.—The Hindoo population of Malabar are not prone to congregate in towns and villages, but for the most part live in separate houses, neatly built and kept scrupulously clean, throughout the country. The towns owe their origin entirely to foreign settlers, and the chief are Calicut, Palghat, Tellicherry, Cannore, and Ponany. At Beypoor, 7 m. S. of Calicut, where the river of the same name falls into the sea, is the terminus of a railway now in course of construction, connecting Madras with the coast of Malabar. There are also extensive iron works erected here by an English joint stock company, with a capital of £400,000; but though they have been in operation for 14 years, their production has been exceedingly limited, and their eventual success is very questionable. Many ships have been built at Beypoor, for the construction of which the forests situated on the banks of the river supply teak timber of a darker color and better description than is found elsewhere, and of very large size. There is also a manufactory at this place where both hemp and cotton canvas is made, but the quality is not very good. It was at Beypoor, and not at Calicut as generally supposed, that the first European navigator touched. The exports of Malabar amount in value to about \$3,000,000 per annum, and have been largely increased of late years. They consist chiefly of cocoanuts and coconut oil, coir rope, pepper, ginger, cardamoms, camphor, coffee, kino, and various gums and resins. The imports do not amount to more than one third of the value of the exports.—It is supposed that Malabar was conquered in very early times by a king from the opposite side of the mountains, and that the Nairs came at the same time as a military body. They took every opportunity to aggrandize themselves, and continued to rule the country till Hyder Ali invaded it in 1760. No land tax was levied in Malabar till this event. Hyder subdued the country, and expelled all the rajahs except such as conciliated him by immediate submission. In 1788 his son Tippoo proposed to the Hindoos to embrace the Mohammedan faith, and followed up his proposition by levying large contributions on his infidel subjects, and forcibly circumcising many of the Brahmins, Nairs, and others. On the breaking out of the war between Tippoo and the British in 1790, the refractory Nairs, many of whom had

fled to the forests to escape his bigoted persecution, joined the latter and succeeded in driving him from the country. With some slight disturbances, Malabar has since remained a portion of British India. During this period the population has doubled, and the country is steadily advancing.

MALABAR COAST, an indefinite term applied to the whole W. side of the Indian peninsula. In a somewhat more restricted sense it means the coasts of Concan, Canara, Malabar proper, Cochin, and Travancore.

MALACCA, a British territory and settlement, situated on the W. side of the Malay peninsula, between lat. 2° and $2^{\circ} 29' N.$, extending about 43 m. along the coast, and varying in breadth inland from 10 to 28 m.; area, 1,000 sq. m.; pop. in 1858, 67,142, composed of the following races: 2,112 Europeans and half breeds, 49,800 Malays, 8,540 Chinese, 1,850 Portuguese, 8,750 Hindoos, 860 Arabs, and 1,230 military and convicts. The territory lies in an irregular triangle, the S. boundary or base of which is formed by the Cassang river, which rises near a remarkable conical hill named Mount Ophir. In the interior the country is arranged in a series of undulating hills and valleys, generally lying parallel to the sea coast. There are no great ranges of hills, but a large number of detached elevations are found, varying in height from 100 to 1,000 feet. Mount Ophir, called by the natives Ledang, is the only considerable elevation; it rises to the height of 4,320 feet above the level of the sea. The general formation of these hills and of the territory is granitic, covered with laterite, or red clay ironstone. The coast line may be divided into 3 portions of distinct character. The W. portion, from Lingie river to Tanjong Kling, 17 m., shows a bold wooded elevation reaching to the sea. Behind this coast plateau the series of hill and valley commences immediately. The central portion, or from Tanjong Kling to the town of Malacca, 5 m., is a sandy beach, with ferruginous rocks, appearing in points jutting into the sea, through a sandy beach. The third part, 21 m., is a mud flat, exposed for a great distance at low water; and the inner portion is covered with mangrove jungle. Inland from the two latter portions, an immense alluvial plain, with detached hills, extends considerably beyond the inner boundary of the territory. The country is watered by 4 navigable rivers, the Lingie, Malacca, Duyong, and Cassang. The Lingie is navigable for vessels of 200 tons as far as Simpang, a distance of 8 m.; while the other rivers can accommodate large cargo boats for nearly the same distance, beyond which canoes are used. Numerous smaller streams fall into the sea. The soil of the low lands is a rich alluvium, varying in color from light brown to red. Round the bases and on the sides of the elevations, rich deposits are formed from the detrition of granite. The territory is said to be capable of producing in perfection almost every article of in-

tertropical culture; but little has been done to develop its resources, and it has never furnished enough grain for the support of its inhabitants. It enjoys the equable temperature and salubrious climate of the Malay archipelago, to which it geologically and ethnologically belongs. The greatest recorded range of the thermometer is from 68° to 86° .—According to official statements, the increase of the native population is greatly checked by the ravages of tigers. Other ferocious animals, as the leopard and black panther, abound. There are 9 species of the monkey tribe. Among the other animals are the elephant, rhinoceros, buffalo, wild ox, tapir, several species of deer, the antelope, and musk deer. The chief crops are rice, black pepper, the cocoa palm, and coffee. Nutmeg plants have been brought from the Moluccas, and cultivated with success. Cinnamon, of superior quality to that of Ceylon, is cultivated for exportation. The chief export is tin, which is found in the alluvial plains in great abundance; it is somewhat inferior in quality to the tin of Banca and other islands S. of the peninsula, and is known in commerce as "strait tin." The yield of the tin mines of the territory in 1856 was about 1,200 tons; but since then, up to 1859, there has been a gradual diminution of product, owing to the exhaustion of the surface ores. In 1854 there were about 8,000 Chinese coolies engaged in these mines; and in 1858 not more than 1,800 were occupied in the tin stream works of the territory. Gold is washed from the sands of all the streams, in fine dust, and about 8,500 ounces are now obtained annually. The trade is chiefly with the neighboring British settlements, Penang and Singapore. The exports in 1858 amounted to 2,813,462 rupees, or a little over \$1,000,000.—In 1851 the government of this province was detached from that of Bengal, and constituted a separate presidency, which includes Singapore, Penang, and this territory. The chief magistrate is styled resident councillor, who is subordinate to the governor of the settlements residing at Singapore.—**MALACCA**, a city and the capital of the preceding territory, is situated in lat. $2^{\circ} 14' N.$, long. $102^{\circ} 12' E.$, 45 m. from the opposite coast of Sumatra; pop. about 80,000. It was the chief emporium of oriental commerce before Europeans visited the Indian seas. The Arabs, Persians, and Hindoos resorted to its port to procure the spices, gums, and other precious products of the Malay archipelago, which they afterward distributed throughout Asia, Africa, and Europe. It owes its commercial distinction to the freedom of its roadstead from hurricanes, or the influence of the monsoons, and to its advantageous situation in the straits of Malacca, the great highway of eastern commerce. When first visited by the Portuguese in 1508, it contained about 35,000 dwellings, and, according to the lowest computation made at the time, 150,000 inhabitants. It was besieged and taken by Albuquerque in 1511. The victor captured upward of 8,000 pieces of brass and iron cannon,

mounted upon the walls of the city, which were said to be superior to any of Portuguese fabrication of that period. The Portuguese held possession of the city for 180 years, and during that period it underwent 19 sieges, 8 of which were undertaken by the Malays, chiefly of the state of Acheen, and the rest by the Dutch, who captured the place after 9 months' siege and blockade in 1641. The Dutch held the city for 154 years, when they surrendered to a British besieging force in 1795. In 1818 it was restored to the Dutch government; but it again reverted to the British in 1824, in exchange for Bencoolen in Sumatra. There are many notable ruins of fortifications constructed by the ancient Malay kings, and many of their tombs; also ruins of monasteries, churches, and fortifications constructed by Albuquerque, including those of the monastery of Madre de Dios, on a hill in the rear of the town, which contained the body of St. Francis Xavier. The Jesuits were in 1859 building a splendid cathedral, and are making extraordinary missionary exertions to convert the natives in the city and territory, and throughout the Malay peninsula.

MALACOA, STRAITS OF, the waters which separate the Malay peninsula from the island of Sumatra. This channel is the most frequented route of European vessels proceeding eastward to Chinese and neighboring points; and it is also in the line of Australian and Malaysian communication with continental India. It enjoys with the Malaysian seas an entire exemption from the hurricanes and typhoons which prevail in the neighboring waters to the eastward and westward. Two lighthouses constructed by the British government, at the N. W. and S. E. extremities, contribute greatly to the safety of its navigation. The channel is about 500 m. long, and from 40 to 800 m. wide.

MALACHI, one of the minor prophets. The name may be defined either "my messenger," or "messenger of Jehovah." Nothing is known of his person or history, and many interpreters, as Umbreit, Hengstenberg, and others, are of opinion that Malachi is not a proper name, but a general title, and that Ezra was the author of this book. From the contents of the prophecy it may be inferred that the prophet lived after Zechariah, since in his time the second temple was already built (iii. 10), and that he was contemporary with Nehemiah (444 B. C.). The prophet reminds Israel of the kindness of God toward them in the past, and complains of the irreligion of the priests and the people (chap. i. and ii.). He then announces the coming of a messenger sent by the Lord to prepare the way for him, and the coming of the Lord himself to judgment, which will be (chap. iv.) condemnation of the wicked and a blessing on the good. The prophecy of Malachi occupies the last place in the canon of the Old Testament, and is referred to in several places of the New Testament. The best commentaries are those of Chytræus (1668), Sal. van Till (1700), Venema

(1759), Hitzig (1838; 2d ed., 1852), Maurer (1841), Ewald (1841), Umbreit (1846), Sohegg (1854), and Reinke (1856). The last two are Roman Catholic scholars.

MALACHITE, an ore of copper, the green carbonate. (For its properties and uses, see COPPER.) A famous mass of malachite, found on the property of the Messrs. Demidoff in the Ural mountains, must have weighed, after allowing for cavities and inequalities, 8,000 poods (108,000 lbs.). Its texture was of large and small kidney-shaped nodules; color from a deep green in some varieties to a fine turquoise tint in others. When polished, it exhibited the most beautiful markings. The geological formation in which it occurred was argillaceous schist; and the immediate bed which contained it was of an ologistic manganiferous iron in a state of decomposition.

MALACOLOGY (*μαλακος*, soft, and *λογος*, discourse), that department of zoology which treats of the *mollusca*, some of which were termed even by Aristotle *malakia* (soft animals), including the examination both of the external shells and the internal organs. In the article COXONOLGY the outer shells of mollusks have been sufficiently described, and their internal organization and habits will be noticed under MOLLUSCA; it only remains here to enumerate briefly some of the principal systems of classification. Linnæus (1766) placed mollusks in his 6th and lowest class of *vermes*, with worms and zoophytes. Humphrey (1797) classified mollusks entirely by the shells, dividing his class *testacea* into the orders: I., marine, and II., fluviatile, each with the divisions of univalves and bivalves, the first having also its multivalves (pholas, barnacles, &c.), and III., terrestrial shells.—As early as 1812 Ouvier had given to the world his views on the classification of animals, founded principally upon his researches in comparative anatomy; he makes the mollusca his 2d branch, with the classes; 1, *cephalopoda* (like cuttle fishes); 2, *pteropoda* (like *clio* or whale bait); 3, *gasteropoda*, with orders *pulmonata* (slugs and snails), *nudi-branchia* (naked marine genera without shells, like *doris*), *inferobranchia* (*phyllidia*), *testibranchia* (*bulia* and *aplysia*), *heteropoda* (*carinaria*), *pectinibranchia* (most of the marine univalves, *turbo*, *trochus*, &c.), *tubulibranchia* (like *siliquaria*), *scutibranchia* (*haliotis*, &c.), and *cyclobranchia* (*patella* and *chiton*); 4, *acephala*, with orders *testacea* (oyster, clam, and most bivalve shells) and *tunicata* (ascidians); 5, *brachiopoda*, like *terebatulula*, *crania*, and *lingula*; and 6, *cirrhopoda* (like barnacles), now placed among *articulata* in the class *crustacea*.—De Lamarck (1815-'22) arranged the mollusks in 2 classes: one his 11th, *conchifera* or bivalves, with the orders *dimyaria* (having 2 separated muscular impressions on the inside of the shells), and *monomyaria* (with a nearly central single impression); the other his 12th class, *mollusca*, with the orders *pteropoda*, *gasteropoda*, *trachelipoda* (*helix*, &c.), *cephalopoda*, and *heteropoda* (*carinaria*); he placed the ascidians in his 4th

class, *tunicata*, among his apathetic animals; he made of the cirripeds his 10th class, with the orders *sessilia* and *pedunculata*, ranking them and the next two classes among sensitive animals.—De Blainville (1822), in his 4th type or *malakozoa* (*mollusca*), makes the classes: 16, *cephalophora*, with the divisions *diocia* (cephalopods and most gasteropods) and *hermaphrodita* and *monoica* (the remaining gasteropods), and 17, *acephalophora*, with divisions *palliobranchia* (brachiopods), *lamellibranchia* (*acephala*), and *heterobranchia* (ascidians); he makes improperly a distinct type for the cirripeds and chitons, the former being crustaceans, and the latter gasteropods (though forming his class 15, or *polyplaciphora*, in the 8d type of *malakozoa*).—Ehrenberg (1836), in his division of *ganglionneura* (with ganglionic nervous system), and subdivision *ephygmozoa* (with a heart and pulsating vessels), makes his 4th section of *mollusca*, characterized by absence of articulations to the body and by the irregular dispersion of the nervous ganglia; he gives the classes *cephalopoda*, *pteropoda*, *gasteropoda*, *acephala*, *brachiopoda*, *tunicata* (simple ascidians), and *aggregata* (compound ascidians); the cirripeds he places among crustaceans.—Burnmeister (1848), in his 8d type or symmetrical animals, makes his 4th sub-type the 4th class or *mollusca*, with the orders *perigymna* (*tunicata*), *cormopoda* (*acephala*), *brachiopoda*, *cephalophora* (pteropods and gasteropods), and *cephalopoda*; cirripeds he places among crustaceans.—Owen (1848-'58), in his "Lectures on Comparative Anatomy," and article "Mollusca" in the "Encyclopædia Britannica" (8th edition), divides the province *mollusca* or *heterogangliata* into 2 sections, *acephala* and *encephala*, according to the absence or presence of a head and its accompanying parts. I. *Acephala*, with the classes: 1, *tunicata*, with orders *saccobranchiata*, *dactylobranchiata*, and *taniobranchiata*; 2, *brachiopoda*, with orders *anthropomata* and *lyopomata*; 3, *lamellibranchiata*, with the groups *monomyaria* and *dimyaria*, with one or two adductor muscles. II. *Encephala*, with the classes: 4, *pteropoda*, with orders *thecosomata* and *gymnosomata*; 5, *gasteropoda*, with the divisions: A, *monacia*, with orders *apneusta*, *nudibranchiata*, *inferobranchiata*, *tectibranchiata*, and *pulmonata*, and B, *diocia*, with orders *heteropoda* (*nucleobranchiata*), *tubulibranchiata*, *cyclobranchiata*, *scutibranchiata*, and *pectinibranchiata*; and 6, *cephalopoda*, with orders *tetrabranchiata* and *dibranchiata*. The cirripeds he places among articulates, though in a class distinct from crustaceans, and he, with his predecessors, retains the *bryozoa* among radiates.—Straus-Durckheim (1848) divides mollusks into 5 classes: 1, *cephalopodes*, with the orders *polythalamæ* and *cryptobranchæ*; 2, *pteropodes*; 3, *gasteropodes*, with orders *heterobranchæ*, *nudibranchæ*, *inferobranchæ*, *tectibranchæ*, *pulmonæ*, *pectinibranchæ*, *tubulibranchæ*, *scutibranchæ*, and *cyclobranchæ*; 4, *acephalæ*, with orders *ostracodermes* and *tuni-*

ciers; and 5, *brachiopodes*.—Siebold (1845) makes 3 classes, as follows: 1, *acephala*, with orders *tunicata*, *brachiopoda*, and *lamellibranchia* (with sub-orders *monomya*, *dimya*, and *inclusa*); 2, *cephalophora*, with orders *pteropoda*, *heteropoda*, and *gasteropoda* (with sub-orders *apneusta*, *heterobranchia*, *tudicola*, *pectinibranchia*, and *pulmonata*); and 3, *cephalopoda*, without orders, but with families *nautilina*, *octopoda*, and *loligina*. (See Burnett's translation, Boston, 1854).—Leuckart (1848) divides mollusca into 4 classes: 1, *tunicata*, with orders *ascidia* and *salpa* (he is inclined to make these not simply a class, but a type intermediate between echinoderms and worms); 2, *acephala*, with orders *lamellibranchiata* and *brachiopoda*; 3, *gasteropoda*, with orders *heterobranchia*, *dermatobranchia*, *heteropoda*, *ctenobranchia*, *pulmonata*, and *cyclobranchia*; and 4, *cephalopoda*.—Van der Hoeven (1846-'55) makes 3 classes: 1, *tunicata*, with orders *thaliacea* (*salpa*) and *tethyonidea* (ascidians); 2, *conchifera* (bivalves), with orders *palliobranchiata* (brachiopods) and *lamellibranchiata*; and 3, *mollusca*, with orders *pteropoda*, *gasteropoda*, and *cephalopoda*.—Before giving the classifications of Milne-Edwards and Agassiz, which seem to be the truest to nature, it will be instructive to glance at a few physio-philosophical and embryological systems as compared with the preceding founded upon anatomical structure. Oken (1809-'48) places the mollusca in his province of *dermatozoa* (sensitive or tegumentary animals) or *eplanchnozoa* (visceral or fleshless animals), and in the circle of vascular, sexual animals, equivalent to *malakozoa* and *conchozoa* (glandular or shell animals); according to the anatomical system, the vascular animals are either venous (like mussels), arterial (like snails), or cardiac (like kraken or cuttle fishes); according to the development of the feeling sense, the sexual animals (the same as the vascular) are either ovarian, orchitic, or renal. In his system (see his "Physiophilosophy," Ray Society ed., 1847) the first class of mollusks, (venous, ovarian animals or mussels) has the following orders: I. Protozoid mussels, with the families: 1, infusorial mussels or *pholades*; 2, polypary mussels or *tellinidæ*; and 3, scalephan mussels or *cardiacea*. II. Conchozoid mussels, with families: 4, typical mussels; 5, snail mussels or *aracea*; and 6, kraken mussels or *ostracea*. This corresponds to the *acephala*, and is characterized by a membranous heart with 2 auricles. The second class (arterial, orchitic animals or snails) has the following orders: III. Protozoid snails or *androgyne* (bisexual), with the families: 7, infusorial snails like *doris*; 8, polypary snails or *patellæ*; and 9, scalephan snails or *limacida*. IV. Conchozoid snails or *diociti* (with separate sexes), with the families: 10, mussel snails or *capulidæ*; 11, typical snails or *turbinidæ*; and 12, kraken snails or *buccinidæ*. This class corresponds to gasteropoda, having a membranous heart with one auricle. The third class (cardiac, nephritic animals or *kraken*) has the following orders:

V. Protozooid kraken, with the families: 18, infusorial kraken or *salpa*; 14, polypary kraken or ascidians; and 15, aculephran kraken or cirripeds. VI. Conchozooid kraken, with the families: 16, mussel kraken or brachiopods; 17, snail kraken or pteropods; and 18, typical kraken, cephalopods or cuttle fishes. It will be seen from this system that the principles of Cuvier respecting the different plans of the 4 great divisions of the animal kingdom are entirely set at nought, orders, according to Oken, representing in their respective classes the characteristic features of the lower types.—Oarus (1818-'86) makes the mollusks his 2d circle or *corposoa*, and 2d class or *gastrosoa*, with the following 8 orders: 1, *apoda* (ascidians), related to *protozoa*; 2, *pelecypoda* (common bivalves), related to *scalephs*; 3, *gasteropoda* (snails); 4, *crepidopoda* (chiton); 5, *pteropoda*; 6, *brachiopoda*, and 7, *cirripedes*, both related to articulates; and 8, *cephalopoda*, related to fishes.—Among the embryological systems may be mentioned those of Von Baer, Kölliker, Van Beneden, and Vogt. Von Baer (1827-'8) calls the mollusks the massive type, as the body and its parts are formed chiefly in round masses, the shape unsymmetrical, the nervous ganglia diffused and appearing late, and the movements slow and feeble; in the course of development identical parts are produced, curving around a conical or other space. According to Kölliker (1844), in the mollusks the embryo arises from a primitive part, grows uniformly in every direction, and either entirely encloses the embryonal vesicle, early in gasteropods and *acephala*, or late (forming a temporary vitelline sac) as in *limax*, or else contracts above the embryonal vesicle, forming a genuine vitelline sac, as in cephalopods. Van Beneden (1845-'55) places mollusks with worms and radiates under his group of *alloeotyledones* or *allovitellians*, in which the vitellus or yolk enters the body neither from the ventral nor from the dorsal side; his class *mollusca*, at the first date, included cephalopods, gasteropods, pelecypods, and brachiopods; in his later work he added *acephala*, *tunicata*, and *bryozoa*, removing the last two from the polyps; the cephalopods, however, are not *allovitellians*, and any classification which unites in one group mollusks, worms, and radiates cannot be founded on correct principles. Vogt (1851) adopts the distinction of Kölliker, of animals in which the embryo is developed from the whole yolk, and those in which it arises from a definite part of it, in the former of which he places mollusks, with worms and radiates; he makes a primary division of the cephalopoda, in which the yolk is cephalic, with a class of the same, with the orders *tetrabranchiata* and *dibranchiata*. In the division *mollusca*, with an irregular disposition of the organs, he makes the following classes. I. *Cephalophora*, with sub-classes: 1, *pteropoda*; 2, *heteropoda*; and 3, *gasteropoda* (with orders *branchiata* and *pulmonata*). II. *Acephala*, with sub-classes: 1, *brachiopoda* (with

orders *rudista* and *brachiopoda*); and 2, *lamellibranchia* (with orders *pleuroconcha*, *othoconcha*, and *inclusa*). III. *Tunicata*, with orders *ascidia* and *biphora*. IV. *Ctenophora*, subdivided only into families. V. *Bryozoa*, with orders *stelmatopoda* and *lophopoda*. The last 3 classes constitute his *molluscoidea*. The separation of the cephalopods is unjustifiable, and the transfer of the *ctenophora* from *aculephran* radiates to mollusks cannot be maintained.—Milne-Edwards (1855) divides the 2d branch, *mala-cocoaria* or *mollusca*, into the 2 sub-branches: 1, mollusks proper, with the classes of cephalopods, pteropods, gasteropods, and *acephala*; and 2, *molluscoidea*, with the classes *tunicata* and *bryozoa*.—Prof. Agassiz, in his "Essay on Classification" (1857), makes only 8 classes of the branch of mollusks: I. *Acephala*, with orders: 1, *bryozoa* (including the *vorticella*); 2, *brachiopoda*; 3, *tunicata*; and 4, *lamellibranchiata*. II. *Gasteropoda*, with orders: 1, *pteropoda*; 2, *heteropoda*; and 3, *gasteropoda* proper. III. *Cephalopoda*, with orders: 1, *tetrabranchiata*, and 2, *dibranchiata*. This classification is founded on both anatomical and embryological characters. Cirripeds unquestionably belong among articulates; he includes *bryozoa* among mollusks, uniting with them the *vorticellida*, the plan of their structure not being radiated, but distinctly bilateral, and gradually leading through the brachiopods and tunicates to the ordinary *acephala*; *tunicata* show in the simple ascidians pedunculated young, resembling *boltenia*, and forming a connecting link with the compound ascidians; cephalopods are homologous with other mollusks in all their systems of organs, and can no more properly be separated from them as a distinct branch on account of the partial segmentation of their yolk, than can the mammalia from other vertebrates on account of its total segmentation in their case. Prof. Owen, in his article "Mollusca" above cited, makes the boundaries of the class a little different; according to him, some of the compound ascidians have certain affinities to the zoophytes; some of the marine *apneusta* (like *actæon* and *glaucus*) are related to some of the abbranchiate annelids; though cephalopods are the highest, they do not pass into *amphioxus* or any other embryonic form of vertebrate; he retains the bryozoa with the polyps.—Other classifications might be given, but these will suffice to show the progress of the science from Linnæus to the present time. The classification of Prof. Agassiz is probably the truest to nature of any yet made public.

MALACOPTERYGIANS, a division of fishes established by Artedi in the early part of the 18th century, including such as have the fin rays soft, except occasionally the first of the dorsal or pectorals. Cuvier divided them into 3 orders: 1, the abdominal, in which the ventrals are suspended to the under part of the abdomen, behind the pectorals, and not attached to the scapular arch, comprising the greater part of fresh water fishes, as the carp, pike, cat fish,

salmon, herring, and their allies; 2, the sub-brachian, having the ventrals attached under the pectorals, the pelvis being suspended to the scapular arch, comprising fishes like the cod, flounder, turbot, &c.; 3, the apodal, wanting ventrals and sometimes the pectorals, including the eel family. J. Müller limits the term to the group *scomberesocidae* of the sub-order *pharyngognathi*, including the flying fish. This is rejected by Van der Hoeven, who returns to Cuvier's divisions, adding, however, a few families. (See *FISHES*, and *ICHTHYOLOGY*.)

MALAGA, a province of Spain in Andalusia, bounded N. by Cordova, E. by Granada, S. by the Mediterranean, and W. by Cadiz and Seville; area, 4,792 sq. m.; pop. in 1849, 498,000. The Genil and Salado rivers are on its N. border, and the Guadiaro on the W.; the Guadaljorce flows through the centre, and the Rio Velez in the E. Most of these in the dry season are exhausted, but during the rains are swollen to rapid and frequently destructive torrents. Its surface is mountainous, being traversed by ranges of the Sierra Nevada. Lead, iron, graphite, and copper are found. The valleys are fertile, yielding abundantly of fruit, especially the grape. The climate is suitable for the cultivation of the sugar cane, the cotton plant, and the palm tree. Wine, brandy, raisins, figs, melons, lemons, and other fruit are its chief productions, and with anchovies and other fish form its principal exports. It has manufactories of linen, woollen, silk, sails, rope, soap, leather, oil, &c.—**MALAGA** (anc. *Malaca*), the capital, is situated on the Mediterranean, 55 m. S. W. from Granada; pop. in 1847, 68,577; present pop. about 80,000. It is built at the extremity of a wide and deep bay in which a harbor is formed by a mole 2,652 feet long, and surmounted by a lighthouse 180 feet high. The river Guadalmedina, after receiving the Guadaljorce, has its outlet at this place. It is a torrent in winter, but almost dry in summer. The city to the E. and W. is surrounded by mountains, on one of which is an old Moorish castle, built in 1280 and called Gibralfaro. It is laid out in the form of an amphitheatre, and is surrounded by a double wall, with 9 gates and several towers. The streets in the interior are narrow and ill paved, many of them not being wide enough for the passage of vehicles. The Alameda or public walk is 80 feet wide, planted with trees, with carriage ways on each side, rows of buildings beyond, and a beautiful marble fountain at the extremity. A new quarter of the city near the Alameda, occupied by rich merchants, native and foreign, is handsomely built. The cathedral, a compound of Spanish and Italian architecture, erected in the 16th century, has a spire 302 feet high. Opposite is the bishop's palace. The custom house, in the N. E. part of the town, is a very fine building, begun in 1791, but not finished till 1829. Among other public buildings are 4 hospitals, a theatre, and a naval college. The old Moorish dockyard, now within the limits of the

town, from the recession of the sea, is used as a storehouse. A Protestant cemetery has been handsomely laid out about 1 m. from the city; it lies on the side of a declivity between the sea and the citadel.—The exports consist chiefly of the products of the province, the principal being wine and raisins. The latter, which have been improving in quality for a number of years past, are made from the June vintage; a second and third harvest are made into wine, of which there are many varieties and qualities. The best sweet wines are the Muscatel and Vino de Guindas, or wine flavored with cherries; Malaga or mountain wine is made in October and November. The entire production of the vineyards around Malaga is estimated at 40,000 butts, of which 27,000 are exported. Among minor articles of export are olive oil, saffron, vermicelli, anchovies, cummin and anise seed, soap, figs, almonds, grapes, orange peel, lemons, silk, and leeches. The principal imports are hardware, linen, woollen, silk, and cotton fabrics. In the town are manufactories of soap, leather, linen cloths, and cigars. There are 2 iron foundries for the refining of iron made at Marbella, the ore of which is obtained from the rich mines of Sierra Blanca near that place.—Malaga was founded by the Phœnicians, and subsequently passed under the dominion of Carthage and of Rome. Its name is variously derived. Humboldt ascribes it to the Iberians; others connect it with *melah*, salt fish, for the exportation of which it was famous. In 714 it was seized without opposition by the Moors, who held it until 1487, when it was taken by Ferdinand and the Catholic after a protracted and dreadful siege. In 1810 Sebastiani, the French general, took and sacked the city, exacting a contribution of 12,000,000 reals. It was again taken by the French in 1823. Gen. Torrijos and 49 liberals suffered military execution in this city on Dec. 11, 1881. A monument has since been erected to their memory in the Plaza del Riego.

MALAN, **CÉSAR HENRI ABRAHAM, D.D.**, a Swiss theologian and author, born in Geneva, July 8, 1787. His ancestors, who were noble and Protestant, fled on account of persecution from Mérindol in southern France to Switzerland in the 17th century. At an early age he became a minister of the state church and a regent in the college of Geneva. Afterward, through the influence of Dr. Mason of New York and Robert Haldane of Scotland, from a Socinian he became a Trinitarian, and the leader of an independent establishment, in which he received much sympathy from English and Scotch Christians. He has often visited England, and Prof. Wilson, in his "Nœtes Ambrosianæ," in 1828, speaks of his eloquence. All his publications are of a religious character, and many have been translated and republished in England and the United States. Among these are the "Church of Rome," translated by Robert Baird, D.D. (New York, 1844); "Stories for Children" (1852); and "Pictures from Switzerland" (1854).

The American tract society and the publishing department of the Dutch Reformed church have printed many of his tracts. His most important work is his volume of hymns, entitled *Chants de Sion*, of which he composed both the words and the music. He has been termed the French Dr. Watts.—**SOLOMON O.**, son of the preceding, born in Geneva in 1812. After completing his education at Geneva he went to Oxford, where he was graduated. At the age of 22 he was appointed professor of oriental languages in the Bishops' college, Calcutta. On account of impaired health, he returned after a few years to England. Subsequently he visited the East, and resided for a time in Arabia, where he acquired many Arabic dialects. He made some very accurate and beautiful sketches of the remains of Nineveh, for the use of which Mr. Layard acknowledges his obligations. He spent some time in the Armenian convent near Venice, where printing is done in 38 languages. He became the intimate friend of Mezzofanti, since whose death he is supposed to have no superior as a linguist. He is able to use in conversation familiarly 26 languages, and to translate no fewer than 122. He has published but little; "*Magdala and Bethany*," and "*God in the Chinese Language*," are the most important of his writings. He is now rector of Broadwindsor, Dorsetshire, England.

MALARIA (Ital. *mala aria*, bad air), or **MARSH MIASM** (Gr. *μαῖσμος*, to infect), an emanation which produces in mankind intermitting and remitting diseases. This poison is not cognizable by the senses, nor can it be detected by chemical tests; it is known only by its effects. The concurrence of vegetable matter susceptible of decay, of moisture either on the surface or a short distance below it, and of a certain elevation of temperature, is necessary for its evolution; of these, long continued heat has the greatest influence in increasing the intensity of the poison. Comparatively harmless in the northern part of the temperate zone, it becomes malignant and deadly in places equally favorable to its production, just in proportion to the increase in the mean annual temperature. As the term marsh miasm implies, marshes, whether salt or fresh, and wet meadows are especially subject to malaria, particularly when drying under the influence of a hot sun. Grounds alternately flooded and drained are fertile sources of it, and it is this which renders the cultivation of rice so deleterious. Grounds which, from the nature of the sub-soil, retain the moisture a short distance beneath the surface, though that may be dry and parched, are favorable to the production of malaria. The process of clearing a new country of its woods, and thus exposing the soil to the full action of the sun, is commonly followed by the prevalence of fevers; and the same evils often follow the ploughing up of meadow lands. It is not necessary that the amount of the vegetable matter be great or its growth recent, since malarious diseases have often been caused by the drainage

of ponds and lakes; and the fevers that prevailed at Bourg-en-Bresse ceased on filling in the half wet ditches of the fortifications. The low grounds on the margin of lakes and the alluvial lands bordering rivers in warm countries are always plagued with malaria. In India ground covered with low thick growths of brushwood or of weeds and grass, called jungles, are so well known to produce malarious fevers, that they are there termed jungle fevers; even open woods in tropical climates are productive of malaria. The steeping of hemp and flax, and the decay of vegetable refuse, potatoes, &c., in confined localities, as cellars or the hold of a vessel, have resulted in fever.—The quantity of water required for the generation of malaria is not large, a marsh completely covered with water being innocuous; it is only when the moisture is drying up under the influence of a hot sun, that it becomes pestilential. So in tropical climates disease prevails chiefly at the commencement and after the termination of the rainy season, and is less prevalent while the earth is saturated. In some cases the quantity of vegetable matter concerned in the production of malaria must be exceedingly small. Dr. Ferguson, one of the medical officers in the army of the duke of Wellington, says: "In Spain, during the month of May, 1809, which was cold and wet, the army remained healthy; but in June, which was remarkably hot and dry, marching through a singularly dry, rocky country of considerable elevation, several of the regiments bivouacking in the hilly ravines which had lately been water courses, a number of the men were seized with violent remittent fever (the first which had shown itself on the march) before they could move from the bivouac the next morning; and this portion of the troops exclusively were affected with this disorder for some time. In this instance, the half dried ravine having been the stony bed of a torrent, in which soil never could be, the very existence of vegetables, and consequently of their humid decay and putrefaction, was impossible, and the stagnant pools of water still left among the rocks by the water course were perfectly sweet. Yet this situation proved as pestiferous as the bed of a fen." ("On the Nature and History of Marsh Poison," Edinburgh, 1821.) Here, however, the total absence of vegetable matter would be difficult to prove, and would be in contradiction with all other experience.—Whatever may be the nature of malaria, it is most concentrated near the surface of the earth, and becomes weaker as we rise above it; it is also most active at night, probably from the influence of the sun in rarefying and producing currents in the atmosphere, and perhaps, too, because it has a peculiar affinity for the fogs that are then apt to prevail. In malarious countries it is well known that exposure to the night air is apt to be followed by fever, and that those who sleep in the upper rooms of a house are safer than those who lodge on the ground floor. While as a general rule low and damp grounds

are much more unhealthy than the hills in their neighborhood, yet there are numerous instances in which this rule does not hold good, or is even reversed. The experience of the British army in the East and West Indies is conclusive on this point. In many instances this can readily be explained by the effect of winds and currents of air carrying the malaria to the higher, which had been generated on the lower ground; thus in Italy the malaria from the borders of Lake Agnane reach as far as the convent of Camaldoli, situated on a high hill 8 miles distant. Connected with the propagation of malaria by currents of air is the fact that woods sometimes act as a screen, protecting a place from the malaria which would otherwise be conveyed to it from some neighboring source; in Italy fevers have frequently become prevalent on the cutting down of trees which have thus served as a shelter. It becomes an interesting question how far malaria can be carried by winds. This has been very variously estimated; probably 8 or 4 miles is the maximum.—The effects of malaria are by no means confined to the production of fevers and diseases of an intermittent type, but it is only in warm climates and in certain unfavorable localities that its full effects upon the constitution are observed. In such places the growth is stunted, the complexion sallow, the limbs slender, the abdomen tumid, the hair lank and scant, and the teeth defective; life is commonly extinguished before 40 years of age, and the population is only kept up by immigration from healthier localities. Yet it is remarkable that when in such places persons live beyond their 40th year, they frequently recover some measure of health and attain to old age.

MALAY ARCHIPELAGO, MALAISEA, OR INDIAN ARCHIPELAGO. See **ARCHIPELAGO**.

MALAY LANGUAGE, the most widely diffused of the many languages of the Indian archipelago. The Javanese is spoken by a greater number of people, but is confined to the island of Java, while the Malay is heard, more or less, on most of the islands from Sumatra to Amboyna, and even beyond. Simple in structure, pleasing to the ear, and easily learned, it forms the common medium of communication where different languages come in contact. Even the Chinese, to whom all European and most Asiatic languages are difficult, acquire it with considerable facility. In marts of commerce, like Singapore, Malacca, Penang, Batavia, Macassar (but not Manila), where many races and languages are brought together, it proves a great convenience and a bond of union. In saying that the Malay is easily learned, the common language of the street and bazaar is meant, and not the language of books. This last is somewhat difficult, and is made more so by the Arabic alphabet in which it is commonly written, but which is poorly adapted to the Malay. For instance, the word *suka*, glad, is written *sk*, or sometimes *suk*; *menuntut*, to demand, is written *mannt*, omitting all the vowels. (Maraden's

Dictionary, 174–445, and 887–406.) Beside, by this alphabet, which fails to distinguish many of the vowels and often omits them altogether, entirely different words, happening to have the same consonants, are written alike and thus confounded. This language can be written, and sometimes is, in Roman letters, which express the Malay sounds with ease and precision. Crawford, whose grammar is the latest and best, says: "The great majority of radical words are dissyllables; a few consist of three syllables, a still smaller number of four; there are a good many monosyllabic words, and words of two syllables abbreviated into one." He supposes *karia*, dagger, to have been shortened into *kris* in the colloquial; *amas*, gold, into *mas*; *ambun*, dew, into *bun*. But the movement of the words may have been in the contrary direction. That the present Malay ear delights in dissyllables is certain; and the educated, or rather the refined class (for there is no enlightened class), are those who incline to change monosyllables into dissyllables. For example, the monosyllabic *braa*, the word for rice throughout the archipelago, is, in the petty court of Bruni, pronounced as a dissyllable, *baraa*. The accent, which is weaker than in English, commonly falls on the penult. Gender, number, person, relation, time, are not indicated by inflections, but by adjectives, prepositions, and auxiliaries. *Anak* is child; *anak-laki* is man-child, or son; *anak-perempuan* is woman-child, or daughter. Number is often to be gathered from the context; sometimes it is formed by reduplication, as *raja-raja*, princes. The adjective is distinguished from the noun by position, not form, belonging after the noun. *Putih* is white, *kain putih* is white cloth, but *putih kain* is whiteness of cloth. The numerals are: 1, *satu*; 2, *dua*; 3, *tiga*; 4, *empat*; 5, *lima*; 6, *enam*; 7, *tujuh*; 8, *delapan*; 9, *sambilan*; 10, *puluh*; 100, *ratus*; 1,000, *ribu*; 10,000, *laka*. The last is from the Sanscrit, but it there means 10 times as much, that is, 100,000, heard every day throughout India in the words "lac of rupees," a phrase which has found its way even into English dictionaries. The Malays, in spreading their numerals to many languages, propagated also this mistake as to the original meaning of *laka*. When they received this word their thought could not get higher than 10,000. The pronouns are numerous, as many as 80, but only 4 are much used: *saya*, *kita*, *engkau*, I, we, you; and *dia*, he, she, it, and they. A considerable number of inseparable particles, prefixes and suffixes, are applied to verbs, to distinguish them from other parts of speech, or to give them a transitive sense; but this peculiarity is found mostly in the written language, less frequently in the spoken. From *prang*, battle, we have *berprang*, to war; from *buah*, fruit, *berbuah*, to bear fruit; from *diri*, self, *berdiri*, to stand; from *istri*, woman, wife, *beristri*, to be wived. The word *istri* is from the Sanscrit, indicating perhaps that the Malays received the institution of marriage from the Hin-

does; or the Sanscrit word, seeming more refined, may have thrown out of use an old Malay word now lost. The Malays have now, however, other words for marriage, one from the Persian, and another from the Arabic. The prefix *ber* occasionally becomes *per*, for euphony. The suffixes *kan* and *i* are transitive or causative particles, both producing commonly but not always the same effect. *Putihkan* means to whiten; *panjang*, long, *panjangkan*, to lengthen; *baik*, good, *baikan* or *baiki*, to make good or mend; *diya*, his or hers, *diyakan*, to make his or hers. The prefix *di* gives a passive sense to a neuter or an active verb; sometimes *ter* and *ka* produce the same effect.

*Mubanya manis kaplu-piluan,
Saperi bulan disapu awan.
Her face is sweet and tender,
Like the moon swept by clouds.*

This couplet is quoted to illustrate the effect of *di* in *disapu*; it also illustrates the capability of the language for poetry. The prefix *me*, followed by *m*, *n*, or *ng*, for euphony, shows that the word to which it is prefixed is a verb, a little like our particle *to*. *Bri* and *membri* have the same signification, to give. *Lain*, different; *melain*, to be different; *melainkan*, to make different or to distinguish. By the suffix *an*, either alone or with the prefix *ber* or *ka*, are formed participles, adjectives, and abstract nouns:

*Ditak kuda tya berkandran,
Parmat, muda, bangebanan.
On a horse riding,
Fair, young, high-born.*

Verbs take a frequentative sense by repetition of the radical. *Sagala dayung-dayung tertawatawa*, "All the girls kept on laughing." *Iya pergi berlari-lari, dan berlompat-lompat*, "They went on running-running and leaping-leaping." The future tense is indicated by *mau* or *andak*, will, want, intend. *Kalau mau pergi* means either, if you want to go, or if you will go. *Tuhan A. mau berlayar esok*, "Mr. A. intends to sail to-morrow." Past time is expressed by placing before the verb *sudah*, *telah*, *abis*, or *lalu*, done, past, finished, gone. *Sudah buat ini terlaku baik*, "You have done this very well." The suffixes *lah*, *tah*, *pun*, and *maka*, and, are chiefly used as expletives, though occasionally they add a little strength or definiteness to the sentence. These, and some other words of little or no meaning, are often used in prose composition somewhat as we use punctuation marks, to mark paragraphs, sentences, and clauses. Conversation dispenses with these cumbrous helps, securing the same end by means of intonations. A considerable number of adverbs are formed by prefixing to the noun or adjective the abbreviated numeral *sa*, one. *Saorang*, alone, literally one man or person; *sakali*, once, one time; *sabanar*, rightly, from *banar*, right. By affixing the pronominal suffix *nya*, of his, her, it, the adverb is sometimes made a little more expressive; thus, *saorannya*, alone, or one man alone of it. By reduplication, *adari-ari*, daily. The principal conjunctions are *dan*, and; *atawa*, or; *tatapi*, but; *kalau*, if; *saperiti*, as.—The

merits of the Malay as a written language, and especially for prose, are small. But for conversational purposes, among a simple, refined, yet ignorant people, it is very beautiful. Many of its compound words are striking and picturesque. Take the following: *anak-dayung*, child of the oar, a rower; *ibu-jari*, mother of the fingers, the thumb; *batu-brani*, brave-stone, the magnet; *karantan-ati*, rust of the heart, malice; *anak-kunchi*, child of the lock, a key; *mata-ayer*, eye of water, a spring; *manis-mulut*, sweet-mouthed, eloquent; *mulut-panjang*, long-mouthed, babbling; *mabuk-ombuk*, wave-sick, sea-sick; *mata-ari*, eye of the day, the sun; and many more scarcely less poetic. Crawfurd finds in the Malay dictionary (there are over 10,000 words in Crawfurd's, and about a quarter less in Marsden's) 516 words from Sanscrit, 750 from Arabic, 95 from Persian, 40 from Telugu, and 87 from Portuguese; he might have added a very few from Chinese and English. The words common to the Malay and Javanese are very numerous, but which has borrowed most largely from the other, or whether both have borrowed from a common source, are questions not easily settled. The words derived from the Sanscrit, though less numerous than those from the Arabic, are more deeply imbedded in the language. *Surat*, writing, is from the Arabic, but *kata*, to speak, is from Sanscrit; *sudagar*, merchant, is from Arabic, *sudara*, brother, sister, from Sanscrit. This last Sanscrit word, and a few others which seem to approach the very cradle of language (though it may still be far removed perhaps), have led some philologists to conclude that the Malay may have been derived indirectly if not directly from the Sanscrit. Crawfurd gives good reasons for rejecting this conclusion. For these reasons we must refer to his learned and very valuable "Preliminary Dissertation," prefixed to his "Malay Grammar and Dictionary" (3 vols., London, 1852). Marsden, observing that there are Malay words widely scattered throughout the islands of the Indian and Pacific oceans, from Madagascar to Easter island, more than half round the globe, took up the hypothesis of Forster, that the 100 or more existing tongues of this vast region had a common origin. He made a polyglot vocabulary of 84 words, in which 80 languages are represented, and with much learning built up a theory which was long and generally received. W. von Humboldt's vocabulary extended to 184 words, in which 9 languages were represented. Crawfurd, with more abundant materials than his predecessors, and proceeding on the idea that men invent languages as they do clothes, houses, and ships, concludes that most of these languages are indigenous, and that the Malay and Javanese words found in them are imported. Instead of taking nouns, adjectives, and verbs for the basis of his comparisons, as Marsden and Humboldt had done, he goes to the particles and auxiliaries, the hinges of language, which pass less easily from language to language, and mark more decisively the original growth.

On this point we refer again to his elaborate dissertation. Though Crawford's dictionary is on the whole the best yet published, it does not in all respects supersede the excellent dictionary of Marsden (4to., London, 1812). This has the advantage of giving the Malay words in the Arabic as well as the Roman character, and the Sanscrit words in the Devanagari; and it abounds in Malay phrases and sentences illustrating the use of words; so that the careful student should have both works.—Malay literature consists of songs, legends, romances, and a very little that may be called history and biography. There are in circulation from 100 to 200 manuscripts. Only two works are known to have been printed. One is the *Sejara Malayu*, "Malay History," printed in Singapore in 1841, in the Arabic character, under the careful superintendence of the Rev. A. North, a superior Malay scholar, and Abdullah, a Malay teacher and author. The other is Abdullah's "Journal" (Singapore, 1888, pp. 159), in Roman and Arabic on alternate pages. There is probably no better specimen of Malay composition of the present century. The *Sejara Malayu* was translated by Dr. Leyden ("Malay Annals," 8vo., London, 1821). Reference should also be made to "Memoirs of a Malayan Family, written by themselves, and translated by W. Marsden" (London, 1880). This little book gives a pleasing and genuine specimen of Malay life, manners, and habits of thought, presenting a truer picture of the Malays than we get from hearing of them only as pirates. Piratical they certainly are, but less so than our worthy ancestors, the Saxons, Danes, and Northmen. Mr. Marsden also commends the book for its style, as "affording a specimen of simple narrative; a style of which some writers have thought the Malays incapable, and which is certainly rare in comparison with the romantic and extravagant tales so prevalent among these and other eastern people." Dr. Leyden's learned essay on the "Languages and Literature of the Indo-Chinese Nations," in vol. x. of the "Asiatic Researches," should not be forgotten. He gives 26 pages to the Malay (168–189), and brief specimens of their poetry. See also an able article in the "Foreign Quarterly Review," Dec. 1834. The Gospels of Matthew and Mark were translated into Malay as early as 1629 (2d ed., Amsterdam, 1688); Luke and John at Amsterdam in 1646 and 1648; the four Gospels and Acts in 1651; the Evangelists and Acts in Roman characters at Oxford in 1677, reprinted in 1704. A complete version of the whole Bible in Malayan was published at Amsterdam in 1738, in Roman, and republished in Arabic characters at Batavia in 5 vols. 8vo., 1758.

MALAY PENINSULA, the name given by European geographers to the long and narrow tract which projects southward from Indo-China, and forms the southern extremity of the Asiatic continent, bounded E. by the China sea and the gulf of Siam, and W. by the bay of

Bengal and the straits of Malacca. It is sometimes called by the Malays *Tana Malayu*, "Malay Land," and is supposed to be the Golden Chersonesus of the ancients. It extends from the parallel of the head of the gulf of Siam, in lat. 18° 30' N., to Cape Romania, in lat. 1° 41' N., or within 74 m. of the equator; length about 800 m.; greatest breadth about 150 m., least about 60 m., and average breadth somewhat more than 100 m.; area, 88,000 sq. m.; pop. conjectured to be about 500,000. The upper part of the peninsula is the narrowest, and has an area of about 22,000 sq. m., with a population composed of Siamese, or a mixed race of Siamese and Malays called Sansam. The lower part is the country of the Malays, and has an area of about 61,000 sq. m. Along the shores of the peninsula are many islands, of which the principal are on the W. side, fronting the Malay country. The chief of these are Trutao, Lancava, Penang, Singapore, Batan, and Bingtang. The islands on the E. coast are fewer and smaller. The most important political division of the peninsula is the British province of Malacca (see MALACCA), which, though small in area, has about half the population of the country. The Malay states are Quedah, Perak, and Balangore on the W. side; Patany, Kalantan, Tringang, and Pahang on the E.; Rumbowe, Jehole, and Jompol in the interior; and the principality of Johore, which comprises the S. extremity of the peninsula. A range of granite mountains runs through the whole length of the peninsula, on both sides of which spread alluvial plains, not much elevated above the sea. The most extensive of these plains are on the W. side of the mountains. The rivers are numerous but small, and are not navigable except so far as the tide ascends them. The largest are the Perak, Johore, and Muar on the W. side. The only lake of any considerable extent is called Brau, and lies between Malacca and Penang.—The zoology of the peninsula is varied and extensive. There are 8 species of monkeys, and a sloth called by the Malays the *kutang*, "the lazy." There are several species of bats, of which the most remarkable is the *ka-lung* or vampire, which is larger than a crow, and flies high in great flocks, and is very destructive to fruit. The only plantigrade animal is a small bear of a kind found only here and in Borneo. There are 4 species of weasels and 7 species of the feline family, of which the largest are the leopard and the tiger, both of which are very numerous and destructive to human life. The domestic cat has a tail about half as long as that of the European cat. The domestic dog exists as a vagrant without a master, and there are said to be wild dogs in the forests. The elephant, the one-horned rhinoceros, the Malay tapir, and the wild hog are abundant. Horses are not found either wild or tame. The ox and the buffalo are used for riding and for draught. The buffalo attains its greatest size in this country, being much larger than the buffalo of India or that of Italy. The domestic

ox is small and short-legged, but strong and hardy; and there are two species of wild ox, one of which, called by the Malays *saladang*, seems to be peculiar to the peninsula. There is a species of wild goat, and a small species of domestic goat. Two species of deer exist smaller than the European hare, a third species about the size of the fallow deer, and a fourth as large as the elk. The sheep and the rabbit are not indigenous, but have been introduced by Europeans. The most remarkable birds are the *marak* or wild peacock, the double-spurred peacock, a small and beautiful species, 8 species of pheasants, a partridge, the wild cock and the domestic cock, the latter a small but very courageous bird. The species of pigeons are very numerous, and some are no larger than a thrush; the prevailing color is green. The parrot family is numerous, but is not remarkable for brilliancy of plumage. The swallow whose nest is eaten by the Chinese is found in the caves of the islands. The birds of prey consist of a variety of kites and hawks. Among the reptiles are the alligator, the iguana, several species of small lizards, and about 40 species of snakes, of which 3 or 4, among them the cobra, are venomous. Fish are very plentiful, and form the principal animal food of the mass of the people. The white pomfret, called *bawal* by the Malays, is said to be one of the most delicate fishes in the world to the European palate. The only cetaceous animal is the dugong.—The botany of the peninsula is as yet imperfectly known. The forests yield ebony, sapan, and eagle wood, and several species valuable for timber. Ratans, bamboos, and palms furnish most of the materials used by the Malays in constructing their houses. Rice, cocoanuta, yams, the sugar cane, and esculent fruits are the chief products of agriculture. Among the fruits, the *durian*, which resembles in size and form a large melon, is the most esteemed by the natives; while by the Europeans, the mangosteen, which grows abundantly, is considered the finest fruit in the world. Pineapples are produced in great perfection, and are as plentiful as turnips in Europe or America. The most remarkable and valuable product of the peninsula, however, is the gutta percha tree, which was here first made known to Europeans.—Iron, tin, and gold are the principal metals. Iron ores are everywhere found, and in the south they exist in vast profusion. The tin mines are the most extensive in the world; and though they are imperfectly worked, the product in 1848 amounted to 2,400 tons. Tin is found in all parts of the country. Gold is not very abundant, the annual product not exceeding 20,000 ounces.—The climate of the peninsula is hot and moist. The mean annual temperature at the level of the sea is nearly 80°, the mean range being from 70° to 90°. There is no rainy season, but rain falls at short intervals throughout the year, and there are heavy dews and frequent fogs. Generally the climate is not unhealthy, though there are some spots infected

with a most pestiferous malaria.—The native population of the peninsula, with the exception of the Siamese portion and the wandering negritos in the mountains of the north, are of the Malay race, and speak the Malay language. Most of the Malays are settled and civilized, but others lead a nomad life on the land, the rivers, or the sea. The land nomads practise a rude agriculture; the river nomads live entirely in boats, and subsist on fish and wild roots. Their boats are about 20 feet in length; at one end is the fireplace, in the middle their utensils, and at the stern is the sleeping place, where beneath a mat a family of 5 or 6 together with a cat and dog frequently find shelter. In these boats they skirt the shores of the rivers, collecting their food from the forests, and when one spot is exhausted proceeding to another. These people are pagans, and are very ignorant and filthy in their mode of life. The sea rovers roam over the whole archipelago in their prahus or boats, and are generally pirates. The civilized and settled Malays are Mohammedans, and their governments are despotic. The peninsula is supposed by some writers to have been the original seat of the Malay race, and to this day it is the only country exclusively occupied by them; for though widely spread in the islands of the archipelago, they are everywhere intermixed with other races. The civilized Malays, however, all claim to be descended from emigrants from Sumatra, who in the 12th century entered the peninsula at its S. E. extremity, where they founded Singapore, and gradually drove back the indigenous inhabitants into the mountains. Before 1276 the Malays were pagans. In that year Sultan Mohammed Shah ascended the throne and adopted Mohammedanism. He reigned at Malacca, and his successors became powerful monarchs. In the 15th century a large part of the peninsula became subject to the Siamese monarchs. In 1511 Mohammed Shah, the 12th Malayan sultan, was overthrown by the Portuguese under Alfonso d'Albuquerque. At present the peninsula is much less populous than in former ages. Its foreign and intestine wars and the incursions of pirates have contributed to its depopulation. The British territory of Malacca, which embraces only about an 80th part of the area of the peninsula, has as many inhabitants as all the rest of the country.

MALAYS (*Malayu*), one of the great ethnological divisions of mankind, and in a secondary sense a race or nation inhabiting the Malay peninsula and its adjacent islands, and portions of Sumatra, Borneo, and other islands of the East Indian archipelago. In the first mentioned sense, the Malay race is more widely scattered on the globe than any other, and in its institutions and social condition exhibits perhaps greater variety than all the other races combined. It is found in nearly all the islands of the Indian and Pacific oceans, in Madagascar and eastern Africa, and, in the opinion of some, occurs on the W. coast of North America. Its

numbers are computed at 120,000,000. The complexion of this race is very uniform, and is always darker than the Mongolian. It is a reddish brown, approaching the hue of burnished copper. The hair is raven black, coarse, straight, and very abundant. The beard is always thin, and some branches of the race are nearly beardless. The practice of eradicating the beard prevails very generally among this race. The females and young men have almost always flattened noses, though as the men advance in years their noses frequently become aquiline. The lips are thicker than among Europeans. There is less prominence of profile in the Malay than in any other race, a peculiarity which appears to be owing in part to the absence of rigidity in the cartilage of the nose. Dr. Pickering says: "The profile has appeared to me usually more vertical than in the white race; but this may be owing in part to the mode of carriage, for the skull does not show a superior facial angle. A more marked peculiarity, and one very generally observable, is the elevated occiput, and its slight projection beyond the line of the neck. The face, in consequence, when seen in front, appears broader than among Europeans, as is the case with the Mongolian, though for a different reason. In the Mongolian the front is depressed, or the cranium inclines backward, while in the Malay it is elevated or brought forward."—The Malay race is divided into two great families, the Polynesians and the Malays proper, or the Malays of the East Indies; between these divisions there is a singular contrast of stature, the Polynesians being taller than the rest of mankind, and the East Indian Malays shorter. The race has a universal attachment to the water, and to a sea life. They have a strongly marked wandering disposition, caring less for fixed homes than perhaps any other portion of mankind. The Malays proper occupy nearly the whole of the Malay peninsula, about one half of Sumatra, and the whole coast of Borneo. Their numbers are estimated at 2,000,000. They may be divided naturally into three classes: the civilized Malays, who have a written language, and have made some progress in the useful arts; the *orang-laut*, "men of the sea," whose only habitations are boats, and who live entirely by the product of the sea and by piracy; and the *orang-banua*, "men of the soil," or aborigines, who are savages, and live precariously on the produce of the forests. This latter class is found only in the interior of the Malay peninsula, in Sumatra, and in the islands lying between them. The civilized Malays inhabit the eastern side of Sumatra, much of the interior of that island, and the coast of Borneo and the Malay peninsula. Wherever settled, they all claim that the original seat of their ancestors was the kingdom of Menangkabow in Sumatra, which in former ages was a famous and powerful state, and undoubtedly the most civilized and distinguished ever founded by Malays. It is certain, however, that Menangkabow was not the original seat of this race. In fact, nothing is known of

their origin nor of their ancient history. Everywhere throughout the archipelago they are regarded as conquerors and settlers; and everywhere they can easily be distinguished from the aboriginal inhabitants. Even in the Malay peninsula, the southern part of which is exclusively occupied by them, there are traces and remnants of an anterior race. They are all Mohammedans, and throughout the archipelago in the common speech of the natives the term Malay is almost synonymous with Mohammedan; so that when any of the pagans, no matter of what race, learn to write the Arabic character and submit to circumcision, they are said to become Malays. In person the Malays are short and slender, with slight and well shaped limbs, particularly small at the wrist and ankles. Deformed persons are scarcely ever seen among them. The women, however, are accustomed to flatten the noses and compress the heads of newly born children, and to pull out the ears of infants to make them stand erect from the head. Their eyes are uniformly dark and clear, and have sometimes the Chinese peculiarity of formation. Their hair is strong and of a shining black, and that of the men is kept cut short, while that of the women is allowed to grow to great length. The beard is naturally thin, and in Sumatra only the priests allow it to grow; the rest of the men carefully eradicating it. Both sexes also eradicate the hair from every part of the body, and to neglect doing so they regard as highly indelicate.—The dress of the Malay men consists of a close waistcoat, without sleeves, but having a neck like a shirt, buttoned close up to the top with buttons often of gold filigree. Over this they wear the *badjoo*, which resembles a morning gown, open at the neck, but fastened close at the wrist and half way up the arm, with 9 buttons to each sleeve. They are made usually of blue or white cotton cloth; for the rich of chintz, and for the chiefs of flowered silk. They wear short drawers, reaching half way down the thigh, and over all the *cayen sarong*, which resembles a Scotch plaid in appearance, and is flung over the shoulder like a sash, or else folded and tucked about the waist and hips, and bound round the body by a belt of crimson silk in which the peculiar Malay dagger, the *creese*, is worn. They have no covering to their legs or feet, and around their heads they twist a colored handkerchief, so as to resemble a small turban. The women wear a kind of bodice reaching to the hips, and over that the *badjoo* and the *cayen sarong*. A piece of fine, thin, blue cotton cloth, about 5 feet long, called a *salendang*, is thrown across the back of the neck and hangs down before, and is used as a veil when the women go abroad. Their houses are uniformly built of wooden frames, closed in and floored with bamboos, and roofed with bamboos or palm leaves. Their furniture is very simple, comprising generally only mats and large wooden salvers, which are used as tables. They eat with their fingers, and use neither knives, forks, nor chop-sticks. Their food is chiefly rice, though they eat also fowls

and the flesh of the goat and buffalo, and their dishes are almost all prepared in that mode of dressing which we call curry, in their language *goolye*. Their knowledge of the arts and sciences is very limited, their principal manufactures consisting of filigree work in gold, and of iron work chiefly in the shape of creeses and other weapons. They are fond of music, and have many kinds of instruments, but these appear to be mostly of Chinese origin.—The chief mental characteristics of the Malays are pride, cunning, and duplicity. They can dissemble the strongest passions beneath the utmost composure of features till the opportunity of safe gratification occurs. They are jealous and vindictive, and have little sense of veracity or integrity. Their courage is not firm or steady, but the effect of a transient enthusiasm, which however sometimes prompts them to deeds of incredible desperation. They suffer death with astonishing composure and indifference when it is clearly inevitable. Their propensity for gambling and betting is excessive, and they sometimes stake all that they have in the world, and even their personal freedom, upon a cock fight or a combat of lizards or of cockroaches. Their governments are founded on principles nearly approaching the feudal, the power of the chiefs being greatly restrained by laws based upon custom. The rajah or prince often assumes the Arabic title of sultan. Under him are a certain number of *dattoos* chosen from among the body of *orang kayos*, or men of rank, who have usually subordinate to them a considerable train of immediate dependants or vassals. From the *dattoos* the rajah appoints the officers of state, as the *shabandar*, who regulates the customs of the port; the *tamongoong*, or military commander; the *bandahara*, or chief judge, and others. The Malays of the present day have degenerated not only from the power but from the spirit and enterprise of their ancestors, whose princes once swept the Indian seas with great fleets, sometimes of 1,000 vessels, carrying 100,000 fighting men. They are still daring freebooters, but their piracies are no longer carried on with the energy or the numbers of former times, and they seldom venture an encounter with armed European vessels. The more civilized Malays build ships of 200 tons burden, well fitted for navigating the seas of the archipelago. They are active traders, and collect gums and spices and other valuable products from the remotest islands, and convey them to Batavia, Singapore, and other European emporia. Of 42 independent Malay states in existence at the time of the first visit of the Portuguese to the archipelago, only Acheen in Sumatra and Bruni in Borneo still maintain their independence.

MALBONE, EDWARD G., an American portrait painter, born in Newport, R. I., in Aug. 1777, died in Savannah, Ga., May 7, 1807. In early life he evinced much fondness for painting, and was in the habit of frequenting the theatre at Newport to watch the process of

painting the scenes. While yet a boy he executed for this establishment an entire scene, a landscape, the praises bestowed upon which encouraged him to devote his attention exclusively to painting. He employed his leisure time in drawing heads in miniature, and at 17 years of age established himself in Providence as a portrait painter. Meeting with considerable success in this calling, he removed in the spring of 1796 to Boston, where he was well received, and during the next 4 years pursued his art with industry in various cities. In 1800 he accompanied Washington Allston, between whom and himself a warm friendship had been formed, to Charleston, and in the succeeding year the two young artists sailed for Europe. Malbone remained a few months in London, where he was urged by Benjamin West, the president of the royal academy, to take up his permanent residence, with the promise of ample professional employment; but he returned to Charleston in Dec. 1801. For several years he painted miniatures in the chief cities of the United States with great reputation; but his sedentary habits and intense application to his art gradually undermined his health, and in the latter part of 1806 he was obliged to make a voyage to the West Indies. The change of climate not proving beneficial, he returned to the United States, and died in Savannah. Of Malbone's merit as a portrait painter, Allston says: "He had the happy talent, among his other excellences, of elevating the character without impairing the likeness. This was remarkable in his male heads; and no woman ever lost beauty under his hand. To this he added a grace of execution all his own." His works, consisting chiefly of portraits in miniature, are widely distributed, many being owned in Charleston, where he was frequently employed. He painted a few compositions, distinguished by agreeable style and warmth and delicacy of coloring, and occasionally attempted landscape in oil.

MALCOLM, SIR JOHN, a British diplomatist, soldier, and author, born in Eskdale, Dumfriesshire, in May, 1769, died May 31, 1838. He was sent to India at the age of 18, in the charge of his uncle Dr. Paisley, and received a cadetship under the East India company. As he grew older he distinguished himself by bravery and intelligence, and after the fall of Seringapatam was secretary to the commission appointed to divide Mysore. In 1799 he was commissioned by Lord Wellesley, who had become personally familiar with his ability and accomplishments, to negotiate with Persia a defensive alliance against an anticipated French invasion of India. He had at this time acquired several eastern languages, and had been in 1792 staff interpreter of Persian. In 1801 he was appointed private secretary to the governor-general, but was again sent to Persia in the following year. In Feb. 1803, he became commissioner of Mysore, and joined the army of Gen. Arthur Wellesley in the Mahratta campaign. In 1805 he was recalled to Bengal, where he was actively occupied in form-

ing treaties of alliance with native princes. In 1807 he went again to Persia, but did not obtain the advantages hoped for by the British government. He returned to Mysore in 1808, but was again sent to Persia in the following year as plenipotentiary. Here, owing to a change in the ministry, he was received in the most flattering manner, and on his departure in 1810 was honored with the order of the sun and moon and made a khan and sepahdar of the empire. In 1812 Malcolm went to England, was there knighted, and published in 1815 a history of Persia (2 vols. 4to.), the materials for which he had drawn from original Persian annals as well as extensive personal research and observation. On returning to India in 1817, he was at once appointed political agent in the Deccan, with the rank of brigadier-general in the army. He served under Sir T. Hislop as second in command during the Mahratta and Pindarree wars, and especially distinguished himself at the battle of Mehidpore, in which Holkar was routed. For his bravery on this occasion he received the thanks of the British parliament; Mr. Canning, president of the board of control, spoke of him as "second in command, but second to no one in valor and renown." After this war, Sir John Malcolm was appointed governor of Malwah and the adjoining provinces. The country was then in a state of anarchy, brigandage and rapine being generally prevalent; he succeeded in restoring order, governed mildly but firmly, and effected a vast amount of good. An account of this part of India was published by him in 1823, under the title of "A Memoir of Central India." He was in England from 1821 until 1827, when he was appointed governor of Bombay, which office he held for 8 years, and then returned to England. He was elected not long afterward to parliament for Lanncoston, and distinguished himself by active opposition to the reform bill. A monument was erected to his memory in Westminster abbey, and also an obelisk 100 feet high near Langholm, in Eskdale. In addition to the works above mentioned, he published a "Sketch of the Political History of India from 1784 to 1823" (London, 1826), and a "Life of Lord Olive" (1836).—See "Life and Correspondence of Major-General Sir John Malcolm, G.C.B.," by John W. Kaye (2 vols. 8vo., London, 1856).

MALCOM, HOWARD, D.D., an American clergyman and author, born in Philadelphia in Jan. 1799. He entered Dickinson college, Carlisle, Penn., in 1818, was licensed to preach in May, 1818, by a Baptist church in Philadelphia, and entered Princeton theological seminary, where he remained 2 years, acting gratuitously at the same time as pastor of a church near Princeton. On finishing his studies, he married and settled over a church in Hudson, N. Y., and was afterward settled in Boston and Philadelphia. He was president of the college at Georgetown, Ky., from 1839 to 1849, and of the university at Louisville, Tenn., from 1851 to 1859, having been obliged by the failure of his voice to relinquish

preaching. In both institutions he filled also the chair of metaphysics and moral philosophy. The disease in the throat increasing, he has retired to private life in Philadelphia. In 1841 he received the degree of D.D. simultaneously from the university of Vermont and Union college, N. Y., and after his resignation at Lewisburg was made LL.D. by that institution. He has visited most of the countries of Europe, and travelled as a deputation from the Baptist missionary society in Hindostan, Burmah, Siam, China, and Africa. He was one of the founders of the American tract society, of which he has been a vice-president from the beginning. He was also one of the prominent laborers in establishing the American Sunday school union, having visited on its behalf, when first organized, every principal city in the United States. His published works are: a "Dictionary of the Bible," which has passed through 140 editions in America and several in London; "The Extent of the Atonement;" "The Christian Rule of Marriage;" "Memoir of Mrs. Malcom;" and "Travels in South-Eastern Asia" (2 vols. 12mo., Boston, 1839). He has also published several addresses and other tracts, and edited the "Imitation of Christ," Law's "Serious Call," Keach's "Travels of True Godliness," Henry's "Communicant's Companion," and Butler's "Analogy of Religion."

MALCZEWSKI, ANTONI, a Polish poet, born in Volhynia about 1792, died in Warsaw, May 2, 1826. He studied at the school of Krzemieniec, entered the national army in 1811, and left it in 1816, having fractured his leg by a fall from a horse. He subsequently travelled in Italy, Switzerland, and France, returned to Warsaw in 1821, and soon after to Volhynia, whence he eloped to Warsaw with the young wife of one of his neighbors, whom he had cured of a dangerous illness by magnetism. Want and misery, however, soon embittered the life of the lovers, and hastened the death of the poet. His principal work, *Marya* (Warsaw, 1825), a metrical romance in the style and spirit of Byron, which appeared in the last year of his life, was severely criticized, but is now generally recognized as one of the gems not only of Polish but of modern poetry. It has passed through numerous editions, and has been translated into French by Clémence Robert, and into German by K. R. Vogel.

MALDIVES, a chain of small coral islands in the Indian ocean, about 400 m. W. from Ceylon, extending in a straight line from lat. 7° 6' N. to 0° 40' S., between long. 72° 48' and 73° 48' E. The length of the chain is about 500 m., and its breadth about 50 m. The number of islands is commonly stated by the natives at 12,000, but is supposed to be in reality nearly 50,000. The great majority of them are mere rocks or sand banks, and only the larger islands are inhabited. They are divided into 17 atolls or circular groups, each atoll being enclosed by a coral reef generally about 90 miles in circumference. (See ATOLL.) These reefs have chan-

nels through them navigable by the boats of the natives; and though the sea beats with great violence on the outside, the water within the reefs is calm and generally shallow. There are deep channels between the atolls, 4 of which have been examined by European vessels and found navigable by the largest ships. The principal island is Mali, in lat. $4^{\circ} 10' N.$, long. $78^{\circ} 40' E.$ It is 7 m. in circumference, and contains 2,000 inhabitants. It is the residence of the sovereign, who bears the title of sultan of the Twelve Thousand Isles, and who acknowledges some degree of dependence on the British government of Ceylon, to which he annually sends an embassy with tribute. The population of the whole cluster is estimated at 300,000. The highest land in the islands is only 20 feet above the sea. Each island is circular in form, and has a lagoon in the centre. The soil is sandy, and at the depth of 8 feet a layer of sandstone is found. The inhabited islands are richly wooded with palms, fig trees, citron trees, and bread-fruit trees. They produce abundance of millet, and of a similar small grain called *brindy*, of both which the inhabitants reap two harvests in the year. They also gather various roots, which, with rice imported from Hindostan, and fish and cocoanuts, constitute their food. The climate of the islands is excessively hot, though the nights are cool and the earth is refreshed by heavy dews. They are unhealthy for Europeans. From April to October is the rainy season, during which the westerly winds are boisterous. In the dry season, from October to April, the winds are easterly. The islands breed prodigious numbers of wild ducks, pigeons, and other wild fowl, which are much used for food, and sold very cheap. There are no large quadrupeds except a few sheep and cows. Cats, polecats, and ferrets are found, and rats are very numerous and troublesome. There is a poisonous species of water snake, and the mosquitoes are said to be larger and fiercer than in any other part of the East Indies.—The Maldivians are strict Mohammedans. They are handsome, well made, and generally of an olive complexion, though some have much fairer complexions than others, which is probably attributable to their descent from Persian or Arab stock, while the majority of the population are obviously of Hindoo origin. The people are ingenious and industrious, and have attained to some degree of civilization. They clothe themselves in silk or cotton robes, and are cleanly in their habits, both sexes bathing regularly once a day. The men shave their heads, but allow their beards to grow. The women allow the hair to grow long, and fasten it up behind. They are not kept secluded as in other Mohammedan countries, but enjoy a tolerable degree of liberty. The Koran is the supreme law, but there are various peculiar local laws and usages. An insolvent debtor becomes the servant of the creditor until the debt is worked out. The ordinary punishment for criminals is whipping, which is sometimes inflicted so severely as to produce

death. Frequently criminals are punished by banishment to the southern islands, which are less civilized than the northern. The people learn to read and write Arabic as well as their own native language, and they have schools in which the mathematics are taught. Polygamy to the extent of 8 wives is tolerated, and divorce is restricted only by the necessity of paying back the dowry received with the wife. The people are a quiet and pacific race, kind and hospitable to strangers, though naturally distrustful of foreigners. They are friendly toward each other, and the ties of kindred are cherished with much affection. The internal commerce of the islands is considerable, for each atoll has its peculiar branch of industry; in one the brewers reside, in another the goldsmiths; looksmiths, mat makers, potters, turners, and joiners, each inhabit exclusively their respective atolls. This division of labor gives rise to a constant intercourse and interchange of commodities, carried on by means of boats, which are sometimes absent for a year from their own islands. Every family, even the poorest, has a boat, and the rich keep several. The multitude of rocks and reefs is so great that this navigation is extremely difficult, and much property is lost by accidents at sea; but the natives being universally good swimmers, their lives are seldom endangered by these shipwrecks. There is some trade with the continent of India, carried on by native boats of about 30 tons burden, built of cocoanut trees. With these boats they make voyages to Calcutta and other distant parts, carrying cocoanuts and cowries or small shells, which pass as coin over all India. They also take for sale ropes made from the husk of the cocoanut, and oil extracted from the fruit itself, and also quantities of dried fish. In return they bring home gold and silver, rice, tobacco, cotton and silk goods, and European articles.—The Maldives have been seldom visited by Europeans. In the beginning of the 17th century a French merchant vessel was wrecked upon them, and one of the survivors, M. François Pyraré de Laval, remained there nearly 5 years, and wrote an account of the islands, which was published in Paris in 1679.

MALEBRANCHE, NICOLAS, a French metaphysician, born in Paris in 1638, died there, Oct. 18, 1715. In his childhood he was physically feeble, and was educated at home with great care. Intended for the priesthood, he studied philosophy at the college of La Marche and theology at the Sorbonne, and in 1660 entered the congregation of the Oratory. He wearied, however, of theological and critical studies, and his philosophical vocation was determined by reading the *Tractatus de Homine* of Descartes, which he accidentally met with, and which impressed him so strongly that his perusal was more than once interrupted by palpitations of the heart. From that time (1664) he devoted himself to philosophy, renouncing all other sciences except mathematics, aiming thus to enlighten his mind

without burdening his memory. After 10 years he produced his principal work, *De la recherche de la vérité* (Paris, 1674), which received numerous additions, and in its 6th edition (1712) extended to 4 volumes. Its extraordinary success was due to its beauty of style and admirable method, as well as to the originality and dignity of its doctrine. The abstractions of philosophy were treated with almost lyrical animation. "Poetry," said Fontenelle, "could not lend to philosophy more philosophical ornaments." In 1677 he published his *Conversations métaphysiques et Chrésiennes*, a discussion on the relation of philosophy to religion and Christian dogmas, which involved him in a long controversy with theologians and Cartesian metaphysicians, especially with Arnauld and Régis. In 1699 he was elected an honorary member of the academy of sciences. Withering slowly away, till he was hardly more than a skeleton, he died "a tranquil spectator of his own long dissolution." His later more important publications, partly philosophical and partly religious, were the *Traité de la nature et de la grâce* (Amsterdam, 1680); *Méditations métaphysiques et Chrésiennes* (Cologne, 1688); *Traité de morale* (1684); *Entretiens sur la métaphysique et sur la religion* (1688); and *Réponses de Malebranche à Arnauld* (4 vols., 1709). A complete edition of his works was published at Paris in 1712, in 11 vols.—The following characterization and criticism of the philosophy of Malebranche is abridged from Kuno Fischer's *Geschichte der neuern Philosophie*. His central and peculiar idea is that human knowledge is a divine act, or, as he himself expresses it, that we see all things in God. On Cartesian principles he regarded matter and spirit, the extended and the thinking substance, as utterly opposed and mutually impermeable. Matter is unknown to mind, which is limited to pure self-consciousness. The mind is thus like a person in the dark, who can truly perceive nothing but himself. The formula that we see objects only in the light symbolizes the Malebranchian vision of all things in God. The idea of God thus becomes nearer and more comprehensive than in the Cartesian system. He no longer as an innate idea merely occupies a mathematical point in the soul, acting beside as a *Deus ex machina* behind the scenes of the world; but he is the absolute substance, in whom exist alike the persons who know and the things which are known by representative ideas. He is the home of spirits and the world of ideas, as space is the place of physical bodies. The mathematical point in the system of Descartes thus gains its periphery in that of Malebranche. The human mind can of itself neither conceive the idea of extension nor engender the knowledge of things, for the reason that all its powers extend only to modifications of thought. Neither the senses, nor the imagination, nor the reason can at the command of the will create ideas of objects. These ideas cannot come to us from material objects, for the mind

is impenetrable to matter; they cannot be born within us, for the soul of itself knows nothing at all about outward things. They therefore, as Malebranche concludes, are divine and not human ideas; they exist in God, who is the universal reason and light that illumines every soul. We know only in God. We know the soul immediately by consciousness; we know material things by means of ideas, as the eye sees colors by means of the light; we know God by immediate vision, as the eye sees the light. As the soul finds its ideas of objects only in God, so it tends of itself toward God, who is the principle both of its knowledge and its will; it aims to unite itself most intimately with God; and in this devotion to the absolute consists the method of attaining to truth. There is throughout the philosophy of Malebranche a tendency to reduce the 3 substances—the thinking, the extended, and the infinite substance, or the soul, matter, and God—to a single substance; but he adheres too strictly to the metaphysics of Descartes to grasp this unity. In Descartes, these 3 substances describe eccentric circles, having no common centre; in Malebranche, they form concentric spheres, not excluding each other, as in Cartesianism, but including each other. Matter is grasped by the soul, and souls by the Deity. Ideas enter the mind, the mind itself existing in God. While in his principles Malebranche thus accepts this Cartesian trinity, in his tendency he renounces it, and in the tone of his statements aims to abolish the dualism of spirit and matter in the one infinite substance which they form. He tends toward Spinoza, and his system marks the transition from Cartesianism to Spinozism. The spirit of his philosophy is to identify all substances in the infinite substance or God, and to represent God as the universal reason, the impersonal and absolute essence both of the soul and of matter. This pantheistic kernel is, however, hidden beneath orthodoxy and Cartesianism, which mask rather than veil the philosophy of Malebranche. In his principles he recognizes the antagonism of the Cartesian dualism, and the dogma of a personal God; in his tendency he reduces spirit and matter to one absolute substance, which he even calls their universal reason; in his principles he recognizes the creator and the created, in his tendency only substance and law; in the former he is dualistic and theistic, in the latter he is pantheistic.—His most important works are contained in the edition by De Genoude (Paris, 1887).

MALESHERBES, CHRÉTIEN GUILLAUME DE LAMOIGNON DE, a French statesman, the last counsel to Louis XVI., born in Paris, Dec. 6, 1721, guillotined April 22, 1794. Of an illustrious family, son of the chancellor of France, he was educated in the Jesuits' college, became counsellor of the parliament of Paris in 1745, succeeded his father in the presidency of the court of aids in 1750, and was at the same time appointed superintendent of the press. He favored the publication of the *Encyclopédie* and

other works of the same authors in defiance of the anathemas of the Sorbonne, and to his facility in this respect La Harpe and others attributed the excesses of the French revolution. He protested in 1770 and 1771 against the imposition of new taxes and the abuses of *lettres de cachet*, for which he was banished from Paris. On the accession of Louis XVI. in 1774, he was called into the ministry with Turgot, and the department of Paris and the police of the kingdom was intrusted to him. His counsels were rejected, and he resigned in 1776 when Turgot was dismissed. He passed the time until the revolution in travels in France, Holland, and Switzerland, and in the pursuits of literature, with the exception of a brief interval in 1787 when he was called into the ministry. When Louis XVI. was arraigned before the national convention in 1792, Malherbes obtained the dangerous honor of pleading his cause, and was one of the last to take leave of the condemned monarch. Eleven months afterward he was arrested with his family by the revolutionary tribunal, and condemned with them to the scaffold. He was a member of the French academy, and also of those of sciences and inscriptions, and wrote several memoirs on topics of rural economy and natural history. His *Discours et rémontrances* (1809) are valuable with reference to financial questions, and his paper *Sur la liberté de la presse* (1809) is remarkable for its enlightened views. A monument was erected to his memory under the restoration.—See Boissy d'Anglas, *Essai sur la vie, les opinions et les écrits de Malherbes* (2 vols., 1818).

MALHERBE, FRANÇOIS DE, a French poet, born in Caen in 1555, died in Paris in 1628. While young he studied at Heidelberg and Basel, and afterward bore arms in the wars of the league. He acquired some reputation in 1600 by an ode on the arrival in France of Maria de' Medici. In 1605, having gone to Paris on business, Henry IV. sent for him, praised his talents, and provided him with the means of remaining at court. After the death of Henry IV. his widow, Maria de' Medici, settled on Malherbe a pension of 500 crowns, "in gratitude for the ode addressed to her." He was noted for his avarice, his contempt of his own art and of poets, his fondness for female society, and his wit. He had a delicate ear and a refined taste, and, being regarded at court as the oracle of elegant language, assumed such an authority as to be called "the tyrant of words and syllables." When dying, his confessor, in speaking of the happiness in heaven, expressed himself inaccurately. "Say no more about it," said Malherbe, "or your style will disgust me with it." He is esteemed as one of the first among the second class of French poets. He is however more remarkable for gracefulness of expression and for choice of language than for original thought. He wrote for the most part light lyrics, odes, stanzas, epigrams, sonnets, and a few devotional pieces.

He also published some translations from Seneca and Livy. The latest edition of his works is that of Pavelle (2 vols., Paris, 1825).

MALIBRAN, MARIA FELICITA, a celebrated singer, born in Paris, March 24, 1808, died in Manchester, England, Sept. 23, 1836. She was the eldest daughter of the well known singer and instructor, Manuel Garcia, by whom she was taken in early childhood to England, where she remained for a number of years. Her father personally instructed her in singing, and by her 17th year she had acquired so great a facility that on June 7, 1825, she was enabled to make her début in London as Rosina, in the *Barbiere di Siviglia*, on the occasion of the sudden departure of Mme. Pasta, who was to have undertaken the part. She sang with success in other operas and at private and public concerts during the same season, giving promise, notwithstanding many marks of youth and inexperience, of great future eminence; and in the autumn of 1825 she accompanied her father to the United States as prima donna of an opera company of which he had assumed the direction. She appeared before a New York audience on Nov. 29, in the part of Rosina, the occasion being memorable in the musical annals of the country as that which witnessed the inauguration of the Italian opera in the United States. Her reception was of the most enthusiastic character, and she appeared successively in a number of parts, each of which subsequently became a perfect creation in her hands. In the midst of her triumphs she was married in March, 1826, to M. Malibran, a French merchant of New York, reputed to be possessed of considerable wealth. He soon after failed, and Mme. Malibran, offended by the readiness with which her husband sought to retrieve his fortunes by her professional labors, surrendered to his creditors the property settled upon her as a marriage dower, and returned alone to Europe. From May 8, 1827, when she made her first appearance before a Parisian audience, until the close of her life, her career was in the highest degree prosperous and brilliant, and her popularity never waned. She was accustomed to spend the winter in Paris and the spring and autumn in England and the larger continental cities; and on two occasions she made professional tours to Naples, Milan, and other Italian cities, where the enthusiasm with which she was received bordered on the wildest extravagance. The French court having in 1835 pronounced her marriage with M. Malibran void, she was married in the succeeding spring to De Bériot, the celebrated violinist. Soon after she was injured by a fall from her horse; but professing to make light of the matter, she went to the Manchester musical festival in the summer, and, contrary to the advice of her physician, took part in the performances. A nervous fever set in, which, in her enfeebled state of health, soon proved fatal.—Mme. Malibran was confessedly one of the first singers of the age, and her dramatic ability was scarcely less remarkable than

her vocal. Her voice, a mezzo soprano approaching a contralto, of great volume and purity, had been brought to almost absolute perfection by the severe training of her father; and in the variety and beauty of her vocal embellishments, as well as in the felicity and dramatic propriety with which she interpreted her music, she has rarely been equalled. Her range included some of the finest rôles, both tragic and comic, in the operas of Rossini, Bellini, and Mozart, including those of Rosina, Semiramide, Tancredi, Desdemona, Romeo, Zerlina, Ninetta, Cenerentola, and Amina, which will long remain identified with her name. She also sang with wonderful effect the sublime music of Handel's oratorios, and many choice selections from Gluck and others. Her personal qualities accorded with her lyric genius, and few women have been more beloved for their amiability, generosity, and professional enthusiasm. Her benefactions amounted to such considerable sums that her friends were frequently obliged to interfere for the purpose of regulating her finances, her heart, as Lablache was accustomed to say, being too big for her little body. Her intellect was of a high order, and the charms of her conversation fascinated all who were admitted into the circle of her intimate friends. She was also an accomplished linguist, speaking fluently and singing in the chief languages of Europe. A memoir of her, in 2 volumes, by the countess of Merlin, appeared in England soon after her death, and was republished in the United States.

MALLARD. See DUCK.

MALLARY, ROLLIN CARLOS, an American lawyer and statesman, born in Cheshire, Conn., May 27, 1784, died in Baltimore, Md., April 15, 1831. He was graduated at Middlebury college in 1805, and held the office of state's attorney of Rutland co., Vt., during the years 1811-'12-'13, and subsequently in 1816. He was elected to congress in 1819, and was 6 times successively reelected. He was a zealous advocate of the protective system; in the 20th congress he was chairman of the committee on manufactures, and reported the tariff of 1828, and by his exertions contributed much to secure its passage.—CHARLES D., D.D., an American clergyman, brother of the preceding, born in Poultney, Vt., in Jan. 1801. He was graduated at Middlebury in 1821, and in 1822 removed to Columbia, S. C., where he was ordained to the ministry of the Baptist church and preached 6 years. He has since resided in Georgia. He was one of the principal founders of Mercer university, and perhaps did more than any other by personal effort to raise its endowment fund. In the great division of the Baptist denomination which took place about 1835 on the missionary question, he was an advocate of the missionary system. His principal works are a "Life of Mercer," and "Soul-Prosperity."

MALLET, DAVID, a Scottish author, born in Orieiff, Perthshire, about 1702, died in London, April 21, 1765. His original name was Malloch. Having studied at Aberdeen, he was en-

gaged as tutor to the children of a gentleman of Edinburgh, from whose service he entered the family of the duke of Montrose, whose two sons he accompanied to Winchester, and afterward attended during their travels on the continent. Returning to England, he settled in London as a literary man, and by the favor of his patron obtained access to the best society of the capital. The poets Thomson and Pope were among his friends. In 1728 his best known poem, the ballad of "William and Margaret," appeared in No. 86 of the "Plain Dealer." In 1738 he published a poem entitled "Verbal Criticism," which so pleased Pope that he introduced him to Bolingbroke, who obtained for him the office of under secretary to Frederic, prince of Wales, with a salary of £200. He wrote political essays in defence of the Newcastle and Bute administrations, from the former of which he got a pension, and from the latter a situation in the customs. The pension is said to have been the reward of his attacks on the unfortunate Admiral Byng. His pen was always at the service of those who would pay for it, not sparing even his old friend Pope, whom after his death, at the instigation of Bolingbroke, he assailed in his preface to that nobleman's "Idea of a Patriot King." For this servility Bolingbroke made him his literary executor. The duchess of Marlborough left by her will the sum of £1,000 to Glover and Mallet jointly, provided they drew up from the family papers a life of the great duke. The task was burdened with several onerous conditions; Glover declined, but Mallet accepted it, and on pretence of being engaged upon the work received for the rest of his life a pension from the second duke. On his death, however, it was found that he had never written a line of it. His most important works, beside those already mentioned, are the poems of "The Excursion" (1738) and "The Hermit" (1747); 8 tragedies played at Drury Lane, "Eurydice" (1781), "Mustapha" (1789), and "Elvira" (1768); "The Masque of Alfred" (in conjunction with Thomson, 1740); and a "Life of Lord Bacon" prefixed to an edition of the philosopher's works (1740). A collection of Mallet's works was published by himself in 1759 (8 vols. 8vo.).

MALLET, PAUL HENRI, a Swiss historian and antiquary, born in Geneva in 1780, died there, Feb. 8, 1807. After completing his education he went to Copenhagen, where he was appointed regius professor of belles-lettres in 1752. He employed his leisure in studying the language, history, and archæology of the ancient Scandinavians, and wrote his *Introduction à l'histoire de Danemark* (Copenhagen, 1755-'6). In 1760 Mallet returned to Geneva, and filled the chair of history in the college of that city for 4 years. The most important of his works, beside that above named, are: *Histoire de Danemark* (8 vols. 4to., Copenhagen, 1758-'77); *Mémoires sur la littérature du nord* (6 vols. 8vo., Copenhagen, 1759-'60); *Histoire des Suisses* (4 vols. 8vo., Geneva, 1808); and *Histoire de la ligue Hanseatique* (Geneva, 1805).

His *Introduction à l'histoire de Danemark* was translated into English by Bishop Percy, under the title of "Mallet's Northern Antiquities" (3 vols. 8vo., London, 1770; new ed., by I. A. Blackwell, 1 vol. 12mo., 1847).

MALLOUF, NASSIF, a Syrian linguist, born at Zabouga, on Mt. Lebanon, in March, 1823. He was educated in a convent on Mt. Lebanon. His mother tongue was Arabic, and to this he soon added Persian and Turkish. He learned the principal European languages at a missionary school in Smyrna, and was in 1845 appointed professor of oriental tongues in the Lazarist college of the propaganda in that city. It was there that he composed the greater part of his numerous works, including the *Lipani turkinis anakhtaridir*, or "Key of the Turkish Language" (Smyrna, 1848); *Plaisanteries de Nasr Eddin Khodja*, with the Turkish text (Smyrna, 1849; Paris, 1856); and several grammars, dictionaries, and elementary works in French, with their Persian, Arabic, and Turkish correlatives. During the Crimean war Mallof was the first secretary-interpreter of Lord Raglan, and was officially employed to teach Turkish to the English officers.

MALLOW, a common European plant, described by Pliny under the name of *mala*, and known to Theophrastus as *μαλάχη* (from *μαλαρός*, to soften, in allusion to its softening and emollient properties). The term *mala* is used generically by modern botanists, and embraces a great number of species found in all parts of the world. The genus is likewise the type of the natural order *malvaceae*, which comprises many kindred genera distinguishable mainly in the structural differences of the fruit. According to Lindley, the mallowworts form $\frac{1}{12}$ of the flowering plants of Sicily, $\frac{1}{12}$ of those of temperate North America, and in the equinoctial parts of the same continent $\frac{1}{7}$. It is remarkable that none of the order possess any unwholesome qualities, while all abound in mucilage. The wild mallow (*M. sylvestris*, Linn.) is a handsome plant, with an erect stem and kidney-shaped leaves having 7 deeply crenate lobes; the flowers are large, of a purple or a rosy color, the calyx hairy, the carpels with reticulate-rugose seeds. It grows spontaneously on waste places and roadsides in Britain, and has been known as an introduced and naturalized weed in America. For certain applications, such as fomentations and poultices, its properties are not inferior in value to those of the marsh mallow (see *ALTHEA*), and decoctions of its leaves have been used in dysentery. By far the most common with us is the familiar weed known as common mallow (*M. rotundifolia*, Linn.), so abundant by the wayside, in rich shaded dooryards, and near compost heaps. Its stems are short, simple, spreading widely around, and springing from a long, deeply buried root; its leaves are of a handsome, round, heart-shaped form, somewhat lobed and crenate on their edges; the flowers small, whitish, violet-white, or purplish. The plant is much prized by chil-

dren, who in play seek its flat and circularly disposed mucilaginous seeds under the name of "cheeses;" and by some the plant is known as cheese mallow. The musk mallow (*M. moschata*, Linn.) is also a native of Europe, but with us often cultivated in the garden, for which its handsome, deeply cut leaves, diffusing a pleasant, musky fragrance, and its large rose-colored flowers, render it suitable. The curl-leaved mallow (*M. crispa*, Linn.) is likewise seen in old gardens, conspicuous for its large, strong, tall stem, and rich, deep green, singularly curled foliage, the beauty of which supplies the defect of its flowers, which are rather inconspicuous. The bark of this species, according to Cavanilles, is sufficiently tenacious to be used in making cordage.—There are many very showy flowers belonging to the order *malvaceae*, such as those of *Lavatera*, *malope*, *abutilon*, *sida*, &c., sought for and prized in open border and greenhouse cultivation. The raw cotton of commerce is the hairy covering of the seeds of malvaceous plants. The okra is the pod of *hibiscus esculentus*. The fibre known in India as *sun* is from the bark of *H. cannabinus*, and is a substitute for hemp. The root of *sida lanceolata* is intensely bitter, and is considered a valuable stomachic. A species of mallow (*M. tricuspidata*) is used in the West Indies as a substitute for soap. Dyes as well as medicines are likewise to be found among this extensive order of the mallow plants.

MALMESBURY, JAMES HARRIS, first earl of, an English diplomatist, born in Salisbury, April 21, 1746, died in London, Nov. 20, 1820. He was the eldest son of James Harris, secretary and comptroller to Queen Charlotte, and author of "Hermes," studied at Oxford and Leyden, and through the patronage of his father's colleague and friend, Lord Shelburne, was appointed in 1767 secretary of legation at Madrid, and afterward as *chargé d'affaires* brought to a successful issue the negotiations with the Spanish government in regard to the Falkland islands. Subsequently he officiated for 4 years as English ambassador in Berlin, and from 1777 to 1784 in St. Petersburg. In the house of commons, of which he had been a member since 1770, notwithstanding his absence, he was a follower of Mr. Fox, after whose withdrawal from the cabinet he received from Mr. Pitt the appointment of ambassador at the Hague, which the former had designed for him. While at the Hague he negotiated (1788) important treaties with Holland and Prussia, and in Sept. 1788, was raised to the peerage as Baron Malmesbury, having been knighted in 1780. After his return to England he continued to act with the whig party until 1793, when with other friends of Mr. Fox he joined the party of Mr. Pitt, who again appointed him to a mission to Berlin. In 1794 he negotiated the marriage between the prince of Wales and Caroline of Brunswick, and accompanied the bride to England. His "Diaries and Correspondence," edited by his grandson (4 vols. 8vo., London, 1844) abounds in par-

ticalars of this unhappy alliance, and in other interesting matters relating to his times. In 1796 and 1797 he was employed without result in negotiations for peace with the French republic. Becoming deaf, he spent the rest of his life in retirement. In 1800 he was created Viscount Fitzharris and earl of Malmesbury.—JAMES HOWARD HARRIS, 8d earl of, grandson of the preceding, born March 25, 1807, studied at Eton and Oxford, and entered parliament as member for Wilton in 1841; but by the death of his father (Sept. 10, 1841) he was almost immediately translated to the house of lords. He officiated in Lord Derby's cabinet as secretary for foreign affairs from Feb. till Dec. 1852. He was personally acquainted with the emperor of the French, and advocated a conciliatory policy toward him, which contributed to cement the alliance of the two nations in the Crimean war. He was again secretary for foreign affairs from Feb. 26, 1858, till July 5, 1859, when he was succeeded by Lord John Russell.

MALMESBURY, WILLIAM OF, an English historian, born in Somersetshire about 1095, died in Malmesbury, Wiltshire, about 1150. He was destined for the church, and early entered the monastery of Malmesbury, of which he became librarian and precentor. He was the author of various valuable works, 8 of which were published by Sir Henry Saville in 1596, in his *Scriptores post Bedam*. His "History of the Kings of England" and "Modern History" (*De Gestis Regum* and *Historia Novella*), translated by the Rev. John Sharpe (London, 1815), were reprinted in 1847 in Bohn's "Antiquarian Library."

MALMÖ, a seaport town of Sweden, capital of a laen or district of the same name on the sound, 16 m. E. S. E. from Copenhagen; pop. 10,208. It was formerly well fortified, but its defences have been demolished. The principal part of the town is built around a large square, shaded by lime, alder, and chestnut trees. The churches, theatre, and governor's house are the principal edifices. The chief trade is in grain and brandy, and there are manufactures of gloves. Armistices were signed here between the Danes and Prussians, Aug. 26, 1848, and July 10, 1849.

MALMSEY, a sweet luscious wine, made from a species of grape originally brought from a small town on the southern coast of the Morea called Monembasia. The French call the place Malvoisie, and the wine *vin de Malvoisie*, of which the English term Malmsey is a corruption. The best Malmsey wine is said to be made on Mt. Ida in Candia. But the Malmsey wine of commerce is produced in Madeira, the Canary islands, the Azores, in Sicily, and in the south of France. It is made from grapes grown on rocky ground, exposed fully to the sun, and left to hang on the vines a month later than the grapes used for dry wines. They are not gathered until partially withered. The story that the duke of Clarence, the brother of Edward IV. of England, when condemned to death for treason in 1478, was drowned at his

own request in a butt of Malmsey wine, has no authority but common rumor at the period. Nothing is known of his death except that he died or was executed while a prisoner in the tower of London.

MALONE, EDMOND, an Irish author and critic, born in Dublin, Oct. 4, 1741, died in London, May 25, 1812. He was graduated at Trinity college, Dublin, went to London, and was called to the bar in 1767; but having inherited a considerable fortune, he abandoned the profession of the law, and devoted himself to literature. In 1780 he published two supplementary volumes to Steevens's edition of Shakespeare, and in 1790 his own edition of the great dramatist appeared in 11 vols. 8vo. In 1796 he exposed the Shakespearian forgeries of Samuel Ireland. At his death he left a greatly improved edition of his Shakespeare, which was published in 1821, under the supervision of his friend James Boswell, in 21 vols. 8vo. His other principal editorial labors are: "The Prose Works of John Dryden, with a Memoir;" "The Works of William Gerald Hamilton, with a Sketch of his Life;" and "The Works of Sir Joshua Reynolds."—See "Life of Edmond Malone, with Selections from his Manuscript Anecdotes," by Sir James Prior (8vo., London, 1860).

MALPIGHI, MARCELLO, an Italian anatomist, born near Bologna in 1628, died in Rome, Nov. 29, 1694. In 1656 he was appointed by Frederic II. of Tuscany professor of medicine at Pisa, where he made the acquaintance of the celebrated mathematician Borelli, who first convinced him of the propriety of applying experimental researches to the elucidation of physical science. Ill health, however, soon compelled his return to Bologna, where he continued to practise as a physician till 1666, when he was called to a professorship at Messina. In 1691 he was invited to Rome by Innocent XII., who appointed him his chief physician and chamberlain. Malpighi devoted much attention to the anatomy and physiology of plants and animals, and was the first who investigated accurately the structure of the skin and of the secreting glands. Two editions of his works were published in London in 1686 and 1697.

MALPLAQUET, a village in France, department of Nord, about 10 m. S. from Mons, celebrated for a sanguinary battle between the allied forces under the duke of Marlborough and Prince Eugene, and the French under Marshal Villars, Sept. 11, 1709. The allies, after the capture of Tournay, having advanced upon Mons, the capital of Hainaut, Villars, with a view of obstructing them in the siege of this place, took up a strong position near Malplaquet, having his centre on a rising ground, with intrenchments in front, and his wings protected by dense woods. Marlborough, finding that the prosecution of the siege would be impracticable with so formidable an enemy in his rear, determined, notwithstanding Villars' advantage of position, to risk an engagement. The battle commenced at 8 o'clock in the morn-

ing, the principal attack of the allies being directed upon the enemy's left, where Villars himself held command. The French at first repelled their assailants, but Villars having become disabled by a wound which obliged him to retire from the field, the allies succeeded in forcing the position. The French right, however, commanded by Marshal Boufflers, drove back in disorder the Dutch infantry opposed to them. Boufflers, seeing the centre seriously menaced, then placed himself at the head of the king's household troops, and by a vigorous charge cleared the trenches of the allies. The latter soon returned to the assault, and an obstinate conflict was long maintained in this part of the field, in the course of which the chevalier St. George, son of James II., made 12 desperate charges at the head of the French cavalry. The allies were meanwhile making rapid progress on the left wing, and also on the right, where, through the negligence of the general left in command by Boufflers, the prince of Orange had regained all the advantages lost by him in the early part of the day. Under these circumstances nothing was left to Boufflers, now the chief in command, but to draw off his forces, which was done in good order, the allies not being in a condition to pursue them. In this battle, the bloodiest in the war of the Spanish succession, the allies, who brought into the field 80,000 men and 140 guns, lost in killed and wounded more than 20,000 men; the French, who numbered 70,000 men with 80 guns, lost about half that number; but some accounts place the loss on both sides as high as 42,000. It was the least brilliant of Marlborough's great victories, as it was the last gained by him in the open field, and he has been accused of rashness and a useless sacrifice of lives in attacking Villars. He seems, however, to have had no other alternative than to offer battle or to raise the siege of Mons, the surrender of which city was the fruit of his victory. During the battle Marlborough exposed his person to frequent perils, and the report of his death, which was at one time prevalent in the French ranks, gave rise to the once popular military refrain: *Malbrook s'en va t'en guerre*, which is reproduced from an old song of the 16th century on the death of the duke of Guise.

MALT. See BREWING.

MALTA (anc. *Melita*), a British possession in the Mediterranean, including the islands of Malta, Gozo, and Comino, and the uninhabited islands of Corminetto and Filfla, the entire group lying between lat. 35° 43' and 36° 5' N. and long. 14° 10' and 14° 35' E., about 60 m. S. S. W. from Cape Passaro, the southernmost point of Sicily, and 200 m. N. from Tripoli in Africa; area, 115 sq. m.; pop. in 1856, 142,587, and of Malta proper about 100,000, including nearly 5,000 English and 8,000 other foreigners, the remainder being natives of Malta. The island of Malta is of an irregular oval shape. The substratum consists of soft calcareous sandstone only thinly covered with soil, much of which

has been carried thither from other countries, chiefly from Sicily, and brought under cultivation by the natives, who are remarkable for their bodily strength and energy. There are neither lakes nor rivers in the island, and no forests or brushwood; the verdure is scanty, and most of the surface is an arid rock exposed to the winds blowing from the African deserts. Malta is excessively hot in summer, day and night. The sirocco prevails especially in autumn, and there is little if any land or sea breeze to modify the temperature. Feelings of lassitude are created in summer, but the climate is not considered more insalubrious than in other parts of S. Europe, and during the winter months it is positively delightful. The atmosphere of Malta is so clear that at all times of the year the summit of Mt. Etna may be distinctly seen during the rising or setting of the sun, although at a distance of 180 m. The E. portion of the island contains all the towns and villages, and is separated by a ridge from the W. part, which, although thinly settled, is well cultivated and abounds with the wild thyme and other odoriferous plants, attracting bees, which furnish the excellent Maltese honey. The amount of land under crops in 1855 was 32,505 acres in Malta and 10,688 in Gozo, chiefly in wheat, cotton, and mixed grain. The uncultivated land comprises 14,000 acres. The live stock in 1855 included 4,249 horses, mules, and asses, 4,897 horned cattle, 7,889 sheep, and 2,895 goats. The value of imports in 1855 was £381,429, and of exports £1,098,881; entrances, 8,640 vessels, tonnage 624,945; clearances, 8,544, tonnage 621,021; registered shipping, 200 vessels, tonnage 80,000. The shipping employed in the trade with Great Britain in 1858 comprised 87 vessels outward, tonnage 8,270; and 42 steamers and 208 vessels inward, tonnage 89,177. The direct trade with the United States is not considerable, the exports in 1859 amounting to about \$50,000; but a large number of American ships are engaged in the trade of foreign countries with Malta. Cotton is the staple product of the island, and gives rise to an extensive manufacture of cotton goods. The cabinet work of Malta enjoys a high reputation. Soap, leather, macaroni, and iron bedsteads are manufactured to some extent. The goldsmiths are noted for their elegant workmanship, and the Maltese artisans in other branches are also generally able and intelligent. They are excellent seamen, and their services are in great demand in the Mediterranean. But the bulk of the people are either employed in agricultural labor or in stone-cutting.—The Maltese are derived from an Arabic stock; it is probable, however, that the Arab conquerors have been mixed up with the previous Punic population. Greek is supposed to have been in ancient times the medium of conversation of the higher classes, as Italian and English are at the present day. The present common language of the people is a *patois* of the Arabic, mixed with Italian. The complexion of the Maltese is al-

most as dark as that of the natives of Barbary. The dress of the working classes is a short loose waistcoat, covering a cotton shirt, short loose trousers, woollen caps in winter and straw hats in summer, and a kind of sandals (*korche*) resembling those of the ancient Romans. The women are of dark complexion, and are small, delicate, and generally graceful, and wear in the streets a black veil (*faldetta*). The dress consists mostly of a cotton shift, blue striped petticoat, a corset with sleeves, and a loose jacket covering the whole. Drunkenness is almost unknown, and the people, although perhaps less refined in their appearance, are less vindictive and passionate than other races of southern Europe. They are remarkably fond of poetry, especially in the rural districts, where the taste for improvisation prevails extensively. In music they prefer noisy instruments, as the tambourine, mandoline, and particularly the bagpipe, which accompany the national dances. They marry at an early age. Many of them seek employment in Barbary, Egypt, Syria, Turkey, and other countries. The families ennobled by the knights of Malta have dwindled down to a small number; and the few which remain are not possessed of large property. The national religion is Roman Catholic, under the direction of a bishop and over 1,000 priests, the church property being considerable. The number of Protestants is about 5,000, whose places of worship consist only of a few chapels. Education is promoted by the university of Valetta, by 88 public schools, in 1855 attended by 4,643 pupils (2,525 males and 2,118 females), and by 185 private schools, scattered over the various towns and villages. The principal normal free schools are at Valetta, Senglea, Notabile, and Rabato. The colonial and military authorities and the principal charitable and public institutions are at Valetta.—Malta is a crown colony, the local government being conducted by a governor who is at the same time commander-in-chief (in 1860, Major-General Sir John Gaspard Le Marchant), who is assisted in legislative matters by a council of 7 persons, including the Roman Catholic bishop, the officer second in command, the chief justice, and chief secretary, with 8 unofficial members appointed by the governor. The principal branches of public affairs are the chief secretary's office, quarantine, custom house, land revenue and audit office, and numerous courts of justice. The average annual amount of the public receipts and expenditures respectively is £125,000. The military and naval stations at Malta cost the home government in 1857 £442,722. The garrison consists of about 10,000 men, beside a native regiment comprising 500 men, called the Malta fencibles, the duties of which are exclusively local, and whose maintenance is defrayed out of the revenues of the island. The central position, military strength, and excellent harbor, one of the most commodious and convenient in the Mediterranean, render the possession of Malta of great importance to Britain, and invest

it with admirable advantages for the accommodation and repair of the men-of-war and merchant ships frequenting the Mediterranean. The storehouses or *caricatori* for grain are, like those of Barbary and Sicily, excavated in the rock, making Malta an excellent centre of the corn trade between the Mediterranean and Black seas. The English steamers from and to England, the Ionian islands, Egypt, &c., touch at Malta, and the French steamers between Marseilles, Alexandria, and other parts of the Levant, perform quarantine there.—Beside Valetta and Citta Vecchia, and a few other towns, Malta possesses about 40 casals or hamlets, chiefly remarkable for their picturesque churches. It is separated by a channel from the adjoining island of Gozo, the capital of which is Rabato. The former capital of Malta was Citta Vecchia. The present capital, Valetta, is one of the best fortified places in the world, and serves as a rendezvous for the Mediterranean fleet.—The ancient Melita was important as a commercial station among the nations of antiquity, and it was occupied probably at a very early period by a Phœnician colony. Afterward it became a Carthaginian settlement. At a later period it appears to have been in a measure Hellenized, though there is no historical evidence of its having been in the possession of the Greeks. In 257 B. C. it was ravaged by a Roman fleet under Atilius Regulus; and surrendering to the Romans in 218, it was annexed to the province of Sicily. It became notorious as a resort of the Cilician pirates, but was in a flourishing condition in the days of Cicero, who during periods of disturbance entertained the project of retiring thither. The Maltese cotton fabrics (*vestis Melitensis*) were in great demand in Rome, and they were probably manufactured from the cotton which still forms the principal product of the island. In sacred history Malta is celebrated as the scene of the shipwreck of St. Paul on his voyage to Italy (A. D. 60); though according to some critics Melita in the Adriatic, on the coast of Dalmatia, was more probably the island visited by the apostle. After the fall of the Roman empire the island was for some time in the possession of the Vandals, but was taken from them by Belisarius (A. D. 533), and was subject to the Byzantine empire until the end of the 9th century, when it was conquered by the Arabs. The latter were expelled at the beginning of the 12th century by the Norman conqueror of Sicily, Count Roger, and it was united with Sicily until the early part of the 16th century, when Charles V. took possession of that country and of Malta as heir of Aragon. Under this emperor the knights of Malta (see SAINT JOHN, KNIGHTS OF) became its sovereigns, and held it until 1798, when the French expedition to Egypt under Napoleon seized the island. After the battle of the Nile the inhabitants rose in insurrection and compelled the French to shut themselves up in the fortress of Valetta. They were subjected to a stringent blockade until Sept. 5, 1800, when, reduced by famine,

they surrendered to the English, who had come to the assistance of the Maltese. The island has since remained under the rule of Great Britain.

MALTBY, EDWARD, D.D., an English prelate, born in Norwich in 1770. While young he was the favorite pupil of the celebrated Dr. Parr at Norwich school. He studied at Pembroke college, received in 1806 the degree of D.D., and after exercising sacerdotal functions in Huntingdonshire became chaplain to the bishop of Lincoln. He was consecrated bishop of Chichester in 1831, and transferred to Durham in 1836, which he resigned in 1856. He is the author of several volumes of sermons, an edition of Morell's *Lexicon Græco-Proslodiacum*, and a Greek Gradus (8vo., 2d ed., London, 1840).

MALTE-BRUN, CONRAD, properly MALTZE-BRUNN, a French geographer, born in Thisted, Jutland, Aug. 12, 1775, died in Paris, Dec. 14, 1826. He was educated at the university of Copenhagen. On the outbreak of the French revolution, he incurred the hostility of the Danish government by his republican principles, and had to withdraw to the island of Huen. After an exile of two years he was permitted to return to Copenhagen; but in 1800, having a second time given offence to the government, he went to Hamburg, and thence to Paris, thinking that his political views would render him acceptable to the first consul. In this anticipation, however, he was disappointed; and abjuring politics, he turned his attention to geography. In conjunction with Mentelle, a popular French geographer, he published in 1808-'5, in 16 vols. 8vo., his *Géographie mathématique, physique et politique*. In 1808 he commenced the publication of a periodical entitled *Annales des voyages*, in which an account is given of the various contemporary discoveries in the science of geography. In 1810 appeared the 1st volume of his *Précis de la géographie universelle*. This work was not completed till 1825, and comprises 8 vols. 8vo. (new ed., 1832-'5). Malte-Brun was also the author of various political works and poems. There are English translations of his physical and general geography. Editions of the latter, with additions and corrections by James G. Percival, were published at Boston and Philadelphia (3 vols. 4to. and 6 vols. 8vo., 1828-'32). His *Mélanges scientifiques et littéraires* were published by Nache in Paris in 1828.—VICTOR ADOLPHE, son of the preceding, born in Paris in 1816, is at the present day one of the most prominent geographers of France. He is secretary of the geographical society of Paris, and one of the editors of the *Bulletin* issued by that institution. He is also editor-in-chief of the *Nouvelles annales des voyages*, and is the author of *Les jeunes voyageurs en France*, and, in concert with several others, of *La France illustrée* (1855-'7). He has published a new edition of his father's *Géographie*, and in 1858 he also published a *Résumé historique* of Dr. Vogel's travels in Africa.

MALTHUS, THOMAS ROBERT, an English political economist, born in Albury, Surrey,

in 1766, died in Bath, Dec. 29, 1834. His father was a gentleman of fortune, interested in classical and philosophical studies, and so intimate a friend of J. J. Rousseau that he was appointed one of his executors. Robert received his early education under private tuition, his principal instructors being the Rev. R. Graves, author of the "Spiritual Quixote," and the versatile and controversial Gilbert Wakefield. In 1784 he was admitted to Jesus college, Cambridge, became one of the first classical scholars, obtained prizes for declamation, and was 9th wrangler on taking the degree of bachelor in 1788. He received his master's degree and a fellowship in 1797, entered holy orders, and divided his time between the care of a small parish in Surrey and the prosecution of his studies in Cambridge. In 1798 he published anonymously the first edition of his work on population, which was subsequently much enlarged and modified. The title of the 6th and last revision (1826) is: an "Essay on the Principle of Population, or a View of its past and present Effects on Human Happiness, with an Inquiry into our Prospects respecting the future Removal or Mitigation of the Evils which it occasions." His object at first was to refute the theory of human perfectibility and political optimism, advanced by Condorcet and Godwin, by showing the necessary sufferings of the poor from the tendency of population to increase faster than the means of subsistence. The state and prospects of the poor became the prominent feature and occupied the principal portion of the subsequent editions. He travelled in 1799 through Sweden, Norway, Finland, and a part of Russia, making researches and collecting facts and documents in illustration of his subject; and during the interval of peace in 1802 he explored France and Switzerland. He married in 1805, and was appointed to the professorship of history and political economy in the East India college at Haileybury, the duties of which he fulfilled till his death. His other principal writings are: "Observations on the Effects of the Corn Laws" (8d ed., 1815); an "Inquiry into the Nature and Progress of Rent" (1815); "Principles of Political Economy" (1820); and "Definitions in Political Economy" (1827).—His reputation rests almost exclusively upon the views advanced in his work on population. His first proposition is that population, when unchecked, increases in a geometrical ratio, while food can be made to increase at furthest only in an arithmetical ratio. By geometrical progression the population would be doubled in every generation, and in 500 years would increase to more than a million times its present numbers; but in the most favorable circumstances, the produce of a country could hardly be uniformly and permanently increased to 20 times its amount every 500 years, which, however, would be only arithmetical progression as compared with the geometrical increase of inhabitants. From these two different rates of increase it results

that powerful checks on population must be constantly in action. These checks are divided into the positive and the preventive, the former including all the causes which tend in any way to shorten human life, the latter including on the one hand abstinence from marriage and sexual intercourse from prudential considerations, and on the other the general corruption of morals which tends to render women unprolific. These checks may be resolved into vice, misery, and moral or prudential restraint. Promiscuous intercourse and improper acts to conceal the consequences of illicit connections fall under the head of vice. Unwholesome occupations, severe labor, bad and insufficient food, excesses, exposure, and neglect of children fall under the head of misery. The moral restraint from indulgence and the prudential restraint from marriage he admits to have operated with comparatively inconsiderable force formerly, but maintains that their prevalence is the means by which modern Europe has superseded, to some extent, the more violently penal forms by which vice and misery were formerly repressed. "An infrequency of the marriage union, from the fear of a family, is the most powerful of the checks which in modern Europe keeps down the population to the level of the means of subsistence." The delay of marriage or abstinence from it through life is a deduction from the sum of human happiness, but is a vastly less evil than results from the positive checks. Malthus was one of the founders of the political economy club and of the statistical society, was a member of the most eminent literary and scientific societies of Europe, was a friend and frequent correspondent of Ricardo, and was highly esteemed for personal amiability and disinterestedness.

MALUS, ÉTIENNE LOUIS, a French physicist and military engineer, born in Paris, June 28, 1775, died there, Feb. 28, 1812. At the age of 17 he entered the *école du génie militaire*; but when about to obtain a commission as an officer, he was dismissed from the school by an order from the ministry, on the ground probably that his father, who held a post in the treasury office, was a suspected person. He forthwith entered the army as a private soldier, but was soon withdrawn from the ranks, and selected as one of the pupils of the new polytechnic school, the director of which, Gaspard Monge, placed him in a class of 20 who were to instruct the others. For 8 years he prosecuted his studies with great ardor, giving particular attention to the mathematical theory of optics, and to the properties of light. Upon leaving the school he received a captain's commission in the corps of engineers, and served during the campaign of 1797 with the army of the Sambre and Meuse. Subsequently he participated in the whole campaign in Egypt, and in 1804 he superintended the construction of fortifications at Antwerp and Strasbourg. During the remainder of his life, whatever time could be spared from his professional labors was devoted

to scientific pursuits. His chief publications consist of a mathematical *Traité d'optique*, first published in the *Mémoires présentés à l'institut* in 1810, in which he promulgated some valuable discoveries respecting the refraction of light in transparent media; and of a paper in the *Mémoires d'Arcueil* (1809), and the "Theory of Double Refraction" (*Mémoires présentés à l'institut*, vol. ii.), containing an account of his discoveries respecting the polarization of light, which consisted in showing that light may acquire properties identical with either of two rays yielded by refraction through Iceland spar by the process of simple reflection at a particular angle from any transparent body. This discovery gained for its author his election to the institute and the biennial medal of the royal society of London. He also published an "Essay on the Measurement of the Refractive Force of Opaque Bodies;" "Remarks on some new Optical Phenomena," intended to prove that two portions of light are always polarized together in opposite directions; a paper "On Phenomena accompanying Refraction and Reflection," and one "On the Axis of Refraction of Crystals."

MALVOISIN, or MAWMOISINE, WILLIAM DE, a Scottish ecclesiastic, died July 9, 1288. He was educated and perhaps born in France. In 1199 he became chancellor of Scotland, and in 1200 bishop of Glasgow. In 1203 he resigned the chancellorship, and was translated to the see of St. Andrew's. In 1211, as papal legate, in concert with the bishop of Glasgow, he assembled a council of the clergy and people at Perth, to consider the pope's mandate for an expedition to the Holy Land. In 1214 he officiated at the coronation of Alexander II., and in 1215 appeared at the 4th Lateran council as one of the representatives of the Scottish church. He was a zealous churchman, and, according to Fordun, was equally zealous in support of his personal rights, having deprived the abbey of Dunfermline of the presentation to two livings because its monks had once neglected to provide him with wine for supper. He wrote the lives of St. Ninian and Kentigern.

MALWAH, or CENTRAL INDIA, an old province of Hindostan, comprising a table-land from 1,500 to 2,500 feet above the level of the sea, bounded N. E. by the valley of the Ganges, E. by Bundelcund, S. by the Vindhya chain, and N. W. by the Aravulli mountains, and lying chiefly between lat. 22° and 28° N. and long. 74° and 77° E.; length about 220 m., average breadth 150 m.; the people are mostly Hindoos. It is now divided into a number of native states under British protection, and includes part of the possessions of Sindia and Holkar. The surface is uneven, with a gradual descent northward from the Vindhya mountains. It is watered by many rivers, the chief of which is the Chumbul, an affluent of the Ganges. The soil is fertile, producing cotton, tobacco, opium, indigo, sugar, and grain, and affording pasturage for large numbers of sheep and cattle. The

rivers are not navigable, but a considerable overland trade is carried on in cottons, printed cloths, opium, and other products of the country. The principal towns are Oojein, Indore, Bhopal, Bilsah, Seronge, Mundesoor, Burseah, and Mundoo.—Malwah became tributary to the emperors of Delhi in the 18th century, but subsequently threw off the yoke, and for 180 years formed a powerful independent kingdom. It was then conquered by Akbar, and on the dissolution of the Mogul empire was overrun by the Mahrattas, under whose turbulent occupation it was desolated by those predatory gangs called Pindarrees, whose suppression constituted one of the best measures of Lord Hastings's administration. A police force of Bheels was subsequently organized by the British, and for some time proved highly efficient, but a large portion of it mutinied in 1857.

MAME, ALFRED HENRI ARMAND, a French printer, born in Tours, Aug. 17, 1811. In 1838 the printing establishment founded by his father in Tours came into his possession, in partnership with his cousin Ernest Mame, who since 1851 has been mayor of Tours. The cousins, who are also brothers-in-law, extended the business in common till 1845, when it came under the sole direction of Alfred Mame, who raised it to the greatest importance. The establishment now includes departments for printing, binding, bookselling, and editorial and other business, with all the requisite accessories for each, all the processes of bookmaking, from the first to the last, being completed within its limits. The machinery moved by steam, employed in the printing department, is capable of producing 15,000 volumes per day. On every work day about 8,000 lbs. of books, stitched or bound, are sent forth, which are received into galleries capable of containing 2,000,000 volumes. There are 700 persons employed within, and about 500 outside of the establishment. The special publications of the house of Mame are liturgical and devotional works, or small books for religious education, printed under the auspices of the archbishop of Tours; and also editions of the classics, and elementary treatises on science and education, issued likewise under ecclesiastical authority. Its small prayer books (*Paroissiens*), bound in leather and with gilt edges, are sold at retail for 85 centimes (8½ cents), so great is the economy resulting from the extensive scale on which they are produced. The house of Mame received prizes for specimen publications from the great exhibition in London in 1851, and in Paris in 1855.

MAMELUKES (Arabic, *mamluk*, a slave), a body of soldiery who ruled Egypt for several centuries. They were introduced into that country by the sultan Es-Salih about the middle of the 13th century, and were composed originally of Asiatic youths purchased from Genghis Khan, whose captives they were. They were called the Bahree Mamelukes, or Mamelukes of the river, because they were first lodged and trained on an island in the Nile. They

formed the body guard of the sultan. Tooran Shah, the son and successor of Es-Salih, becoming unpopular, the Mamelukes deposed and murdered him about 1250, and raised their commander Eybek to the throne. A line of sultans known as the Bahree or Turkish dynasty now followed, all of whom were raised to power by the Mamelukes, and many of them deposed and slain. A new band of Mamelukes, however, had been created by these sovereigns, composed of Circassians and Georgians, who were called Borghees, which signifies of a tower or castle, from the fact that they were first employed to garrison the fortresses of Egypt. In 1387 the Borghee Mamelukes gained the ascendancy over the Bahrees, and made their commander Barkook sultan. The Borghees continued to rule the country till 1517, when they were subdued by the Ottoman Turks, and Egypt became a dependency of Constantinople. The Turkish sultan did not deprive the Mamelukes of all power. He divided Egypt into 24 provinces, each of which was placed under the jurisdiction of a Mameluke bey or chief. This body served as a check upon the pasha to whom the general government was intrusted. The beys also had the right to elect the *sheik-el-bellad* or governor of Cairo, an officer of great power. "A more unjust and absurd constitution," remarks Gibbon, "cannot be devised, than that which condemns the natives of a country to perpetual servitude under the arbitrary dominion of strangers and slaves. Yet such has been the state of Egypt above 500 years. The most illustrious sultans of the Baharite and Borghite dynasties were themselves promoted from the Tartar and Circassian bands; and the four and twenty beys or military chiefs have ever been succeeded, not by their sons, but by their servants." The number of the Mamelukes was about 12,000, and they were nearly all from the region between the Black sea and the Caspian, whence they were brought in their youth to Cairo, compelled or persuaded to embrace Mohammedanism, and educated as soldiers. They did not intermarry with the natives of Egypt, but bought wives of their own race from the traders in Circassian slaves. These women from the north seldom bore children in Egypt, or if they did their offspring was sickly and did not long survive. Though instances of hereditary succession among the Mamelukes were not unknown, they were comparatively rare, and the transmission of power and wealth was almost universally from master to slave, and not from father to son. It was asserted by Volney that when he visited Egypt in the latter part of the last century, there was not a single Mameluke family of the second generation: "All the children perish in the first or second descent." The Mameluke beys, soon after the Turkish conquest, contrived to obtain such influence in the country, that eventually they became the virtual rulers of Egypt, while the viceroys of the sultan had only the shadow of power. Each of the 24 beys maintained 500 or 600 followers,

magnificently armed and equipped, and forming the finest body of cavalry in the world. Each of the 12,000 Mamelukes was attended by two armed slaves who fought on foot. In 1798, when Napoleon invaded Egypt, his army first encountered the Mamelukes while on the march from Alexandria to Cairo. "The whole plain was covered with Mamelukes," says Scott, "mounted on the finest Arabian horses, and armed with pistols, carabines, and blunderbusses of the best English workmanship—their plumed turbans waving in the air, and their rich dresses and arms glittering in the sun. Entertaining a high contempt for the French force, as consisting almost entirely of infantry, this splendid barbaric chivalry watched every opportunity for charging them, nor did a single straggler escape the unrelenting edge of their sabres. Their charge was almost as swift as the wind, and as their severe bits enabled them to halt or wheel their horses at full gallop, their retreat was as rapid as their advance. Even the practised veterans of Italy were at first embarrassed by this new mode of fighting, and lost several men; especially when fatigue caused any one to fall out of the ranks, in which case his fate became certain. But they were soon reconciled to fighting the Mamelukes when they discovered that each of these horsemen carried about him his fortune, and that it not uncommonly amounted to considerable sums in gold." At the battle of the Pyramids, July 21, 1798, the Mamelukes mustered their full force and attacked the French with desperate courage. Seven thousand of them, under command of Murad Bey, charged the French squares with matchless intrepidity, dashing their horses against the bayonets and throwing their pistols at the heads of their enemies. They were repulsed with terrible laughter, and their broken and dispirited remnants, about 2,500 in number, fled into Upper Egypt. "Could I have united the Mameluke horse to the French infantry," said Napoleon, "I would have reckoned myself master of the world." After the French were driven from Egypt by the British, the Mamelukes regained in some degree their power, and a civil war broke out between them and the Turks. They were twice subjected to treacherous massacres, but their final destruction as a political and military body was accomplished on March 1, 1811, when the pasha, Mehemet Ali, beguiled their chiefs to the number of 470 into the citadel of Cairo by professions of friendship and on pretence of celebrating a festival, and then closed the gates and ordered his Albanian soldiers to fire upon them. Only one escaped, a bey who leaped his horse from the ramparts and alighted uninjured, though the animal was killed by the fall. Immediately after a general massacre of the Mamelukes in every province of Egypt was ordered. The few who escaped fled to Nubia and to Sennaar, where they built the town of New Dongola and attempted to keep up their force by disciplining negroes in

their peculiar tactics. They did not succeed, however, and a few years later their number was reduced to about 100, when they dispersed, and the Mamelukes ceased to exist as an organized body.

MAMIANI, TERENZIO DELLA ROVERE, count, an Italian statesman and author, born in Pesaro, Papal States, in 1799. In 1881 he took an active part at Bologna in the revolutionary movement which followed the accession of Gregory XVI. to the holy see, and after its immediate suppression by force of arms he fled, and lived in Paris, engaged in literary and patriotic labors, until the amnesty granted on the accession of Pius IX. (1846) permitted him to return to Rome. He took a foremost position among the liberal statesmen who gathered round the new pope, and was even induced to accept a seat in the cabinet. The vacillating policy of Pius IX., however, soon led to his retirement, and he went to Turin, where in concert with Gioberti and other eminent men he founded the "Italian Confederation," of which association he became president. In Nov. 1848, after the assassination of Rossi and the flight of the pope, he returned to Rome, where he took charge of the department of foreign affairs, Rosmini being among his colleagues. His attempts to secure the predominance of moderate liberal ideas over the radicalism of Mazzini failed, and he retired from the administration in December. A few months afterward, as member of the Roman constituent assembly, he opposed the proclamation of the republic and the deposition of the pope, and withdrew from public affairs as soon as the republic was established. He continued, however, to reside in Rome, but strenuously resisted the overtures made to him by Mazzini, and denounced his policy as fatal to Italian nationality. After the French intervention in Rome he retired to Genoa, where he has since resided. In 1856 he was chosen a member of the Sardinian chamber of deputies, and became a zealous champion of the policy of the king of Sardinia and of Count Cavour, in whose administration he now (1860) occupies the position of minister of instruction. The principal merit of Mamiani as a philosopher consists in having shown the paramount importance of the question of method in philosophical researches. This he established on the principles of the Scotch philosophers, combined with those of the eclectic school of France; a method whose origin he traces to the Italian philosophers of the 15th century. Later in his "Confessions of a Metaphysician," undertaking to resolve the highest problems of ontological philosophy, he has shown himself a strenuous defender of realism. As a poet, a scholar, a philosopher, an orator, and a statesman, Mamiani occupies a high place in the contemporary history of Italy. His principal works are: *Del rinnovamento della filosofia antica Italiana* (1836); *Poeti dell'età media* (1842), a collection of classical poetry; *Dell'ontologia e del metodo*, and *Dialoghi di scienza prima*

(1846); *Principi della filosofia del diritto*; and a number of other treatises on metaphysical, ethical, political, and politico-economical subjects. A complete edition of his poetical works was published by M. Lemonnier (Florence, 1857). An English translation of his "Rights of Nations," edited by Roger Acton, has been published (London, 1860).

MAMMALIA, the highest vertebrated animals, including man, warm-blooded, breathing by lungs separated from the abdominal cavity by a diaphragm, generally covered with hair, and bringing forth their young alive, which they nourish by the secretion of mammary glands (whence their name). Most mammals are commonly known as quadrupeds, from their having 4 feet suited for progression on a solid surface; but the terms are not synonymous, as most reptiles are 4-footed, and the whales cannot be called quadrupeds. The form of mammals is very various; among them we see man walking erect, the flying bats, the swimming cetaceans, the bulky elephant, the slow-moving sloth, and the agile squirrel; yet the 3 regions of head, neck, and trunk can always be recognized in the skeleton, and generally in the living animal. The neck, though varying in length from that of man ($\frac{1}{4}$ of the spinal column) to that of the giraffe ($\frac{3}{4}$), with 2 or 3 exceptions consists of 7 vertebrae; some of the sloths have 8 or 9, and some manatees are said to have 6 only; in the hoofed animals the length of the neck depends on that of the fore legs, for the purpose of grazing; but the elephant has a long proboscis to compensate for the shortness of the neck rendered necessary by the ponderous head; the extra vertebrae of the sloths are by some considered as dorsals with rudimentary ribs to give additional mobility to the neck. The number of dorsal vertebrae varies from 11 in some of the bats to 22 in some of the sloths, man having 12; the lumbar vertebrae, 5 in man, are 2 in the ornithorhynchus and 9 in some lemurs, stronger than the dorsals, and without ribs, which are replaced by long transverse processes; the sacral vertebrae, usually 4, vary from 1 to 9; the rudimentary tail of man, the *os coccygis*, consists of 4 bones, but in the long-tailed manis there are 46 caudal vertebrae. The skull is articulated to the spine by 2 occipital condyles, which permit the upward and downward motions of the head, the lateral and rotating movements depending on the articulation between the 1st and 2d vertebrae; in whales the short neck is immovable as in fishes, and its bones are very thin and more or less consolidated together; the strong *ligamentum nuchae*, which supports the head, is attached to the spinous processes and skull. The caudal vertebrae are of 2 kinds, one having a spinal canal, the other not, and the processes are always developed in accordance with the use made of the tail; in most mammals its movements are confined to brushing away insects from the skin, but in the kangaroo it forms with the hind legs a firm tripod from which the animal

springs, and in some South American monkeys it is prehensile and used as a 5th hand in hanging from trees; in the whales it becomes a powerful swimming organ, is provided on its under surface with V-shaped bones for the protection of the blood vessels, and, being horizontal, is used principally as an organ by which to rise to the surface to breathe; in the beaver the transverse processes and the lower spinous are very large for the attachment of the muscles which move the tail like a trowel chiefly in a downward direction. The bones of the spine are united by elastic fibro-cartilages; these, in whales, form osseous disks, separating on maceration, and frequently used by arctic travellers for plates.—As all mammals breathe air, the mechanism of their respiration depends on the movable ribs and the diaphragm; man has 7 true and 5 false ribs, the former united to the sternum, the latter not; the number is in proportion to that of the dorsal vertebrae; in the whale, of 12 ribs, 11 are false, in the man 11 out of 23, in the horse 8 out of 18, in the cat 4 out of 18, and in the manatee 14 out of 16; in the carnivora they are dense and narrow, in the herbivora large, broad, and thick. The breast bone varies in shape according to the presence or absence of clavicles; in non-clavicated animals the chest is compressed laterally, and the breast bone has a projecting keel as in birds; in bats it is much keeled, in the higher apes flat as in man, and in the moles it extends in front of the ribs, forming a distinct piece; in animals with clavicles the chest approaches very nearly to that of man; the human chest, however, is the only one in which the transverse exceeds the antero-posterior diameter, causing the greater separation of the shoulders and the increased facility of movement of the arms. The anterior ribs always extend as far as the breast bone, and are thus true ribs, differing in this respect from those of birds. Each of the ribs is usually connected by its head to an articular cavity formed by the bodies of 2 vertebrae, and by its tubercle to the transverse process of the posterior of the two; in the monotremata they are connected with the body alone, and in cetaceans often only with the transverse processes. The breast bone consists of several pieces, one behind the other, to which the anterior or true ribs are joined by cartilages which rarely become ossified; the posterior are the false or floating ribs, and are not attached immediately to the breast bone; this arrangement gives mobility to the chest, and allows the elevation and depression of the ribs during respiration. The bones of the skull and face are immovably connected with each other, a character which does not occur in any of the lower classes; the brain cavity is larger than in birds and reptiles; the occipital condyles, near the centre of the base in man, are gradually removed to the posterior portion as we descend in the scale; the number of cranial bones, 8 in man, is less than in most lower vertebrates. For the general characters see **COMPARATIVE ANATOMY**, where also are given

sufficient details on the organs of sense, teeth, digestive system, and hairy covering. The lower jaw consists of 2 pieces, and is alone movable; in man it is susceptible of motion up and down, laterally, and from before backward; in the carnivora the 1st movement, in the ruminants the 2d, and in the rodents the 3d, is specially provided for by the shape of the condyles and the form of the glenoid cavity.—The limbs of mammals vary exceedingly in shape, according to the offices to be performed by them; we find the wonderful hand of man with its thumb opposable to the fingers, the 4 hands of the monkey, the paddles of the whale, the walking feet of the horse, the wing of the bat, the powerful paw of the lion, the shovel of the mole, all constructed on the same type and modified from the same bony elements. The anterior limbs are always present, with a well developed scapular arch, usually kept in place by a clavicle; this last is present in man, monkeys, the insectivora, squirrels, and bats, but absent in cetaceans, the hoofed animals, and some edentates; in most carnivora and in some rodents it is imperfectly developed; it corresponds to the furcular bone in birds, and the monotremata have in addition the 2d or coracoid clavicle of birds. The shoulder blade is thin, flat, and more or less triangular, generally with a well marked spine; it is long and narrow in herbivora, and placed perpendicularly on the anterior and lateral portion of the chest; in carnivora and rodents, requiring more freedom of motion, it is oblique, and so of course is the glenoid cavity; jockeys are well aware that an upright shoulder is the mark of a stumbling horse. The arm bone is nearly straight in man, much bent in the carnivora, long in monkeys and sloths, and short in ruminants and cetaceans; it is connected by a ball and socket joint with the scapula; below it articulates with the radius and ulna of the forearm by a hinge joint. The ulna is the longest in man and lies on the inside, and receives the arm bone in a deep sigmoid cavity; the radius is connected with the wrist, and turns with the movements of the hands, rolling around and upon the ulna; this independence of movement becomes less and less, according as the limbs are more used as instruments of progression; in the carnivora and rodents the two bones are distinct, but the rotation is very imperfect, and in the hoofed animals generally the two make a single bone; the radius seems to form the principal bone, the ulna being frequently, as in the horse and bats, very rudimentary. The wrist in man consists of 8 bones in 2 rows, in other mammals varying from 5 to 11; to these are attached the 5 parallel metacarpal bones in man, followed by the 5 fingers, each having 3 joints, except the 1st or thumb, which has only 2; in the ruminants the 2 metacarpals form the single cannon bone, sometimes with rudimentary bones on the side, as the splint bones of the horse; most pachyderms have 3 metacarpals, the elephant having 5. In animals which walk on the ends of the toes, the

metacarpus is so lengthened that it has been mistaken for the forearm, and supposed therefore to be flexed in an opposite direction to that of man; but the lower part of the fore leg of a horse, for instance, is in reality the metacarpus, and the part called the knee is the wrist joint. The fingers vary from 1 to 5; the 3d or middle finger is the most constant, and commonly the longest, and is the only one found in the horse; the thumb disappears first, then the little finger, and then the 4th finger; ruminants have the 2d and 3d, or fore and middle fingers. The hind limbs are more firmly connected to the trunk than the anterior; the supporting arch is the pelvis, composed of the ilium, ischium, and pubis on each side, the 1st joining the sacrum, the 2d forming the prominences upon which man sits, and the 3d uniting in front; in cetaceans there is only a rudiment of this bony arch, and the hind limbs are absent. The thigh bone, the longest in man, is in most other mammals relatively shorter; it is attached by a ball and socket joint to the pelvis, in man its axis being nearly that of the body, but in the lower mammals bending more and more forward until it forms an acute angle with the trunk. The tibia and fibula correspond to the radius and ulna of the forearm, and have the patella or knee-pan in front of the articulation with the thigh bone; these are coalesced in various animals somewhat as are the radius and ulna; the tarsal bones correspond to the carpal, and are followed in the same manner by the metatarsus and toes. In the apes the great toe is opposable to the others, like the thumb, whence they are called *quadrumanæ*, 4-handed; while man rests his whole foot, from the heel to the toes, on the ground, other mammals walk chiefly on the toes; the horse stands on the tips of the middle fingers and toes, the heel being nearly as high up as the knee in man, the cat on the last 2 joints of several toes, and the bear on the metatarsus and toes; there is no animal, except man, that can be properly said to touch the ground with the entire foot; in the seals all the bones of the leg and foot may be recognized, but they are united by a membranous web into a kind of caudal fin. The bones of mammals have not the air cells found in birds, but are either solid or their cavities are filled with an oily matter called marrow; there are, however, air cavities called sinuses, especially large in the frontal bone of ruminants, as in the ox and sheep, and greatly developed in the frontal region of the elephant; these communicate either with the nasal or auditory passages.—While most mammals resemble man in the arrangement of the muscles, others approach birds and even fishes in this respect; as they are less active than birds, their muscles are less firm and the tendons less liable to ossify; they are generally fewer in number than in man, and their variations from the human type are noticed chiefly in the limbs; in the mole, for instance, the flexors of the arm, the great pectoral, and the *latissimus dorsi* are very large; the herbiv-

ora and pachyderms require massive muscles, and the agile carnivora compact and energetic ones; the muscles of the ears are specially developed in the herbivora, and those of the nose in the hog; the *gluteus maximus*, the largest of all in man, is much smaller in the monkeys, and very small in the lower mammals; the nates in the horse are composed principally of the *gluteus medius*; the muscles of the calf, so characteristic of man, are small in all below him, and the short muscles of the human hand are absent in the lower mammals; those of the wings in bats are arranged somewhat as in birds, and those of cetaceans as in fishes. The principal muscle remarkably developed in many mammals, but rudimentary in man, is the cutaneous layer, the *panniculus carnosus*, of which the human analogue is the *platysma myoides* of the sides of the neck and face; we notice its action in the horse when a fly or any irritating object touches the skin, in the erection of the quills of the porcupine, and in the coiling of the body of the armadillo. The minute coccygeal muscles of man are represented by numerous and powerful ones in the prehensile tail of certain monkeys, in the strong trowel of the beaver, and in the fluke of the whale, analogous to the human *multifidus spinae*.—In man and mammals the heart is composed of 2 distinct halves, each divided into 2 cavities, an auricle and a ventricle; the course of the blood is from the left ventricle to the aorta and over the body, pure arterial; then traversing the systemic capillaries it enters into the veins, and is carried to the right auricle; thence it passes to the right ventricle, and thence by the pulmonary artery to the lungs, in whose capillaries it becomes purified by the oxygen of the respired air, and is returned by the pulmonary veins to the left auricle, whence it enters the left ventricle to be distributed as before. Here, therefore, the blood passes twice through the heart and through 2 systems of capillaries before completing its circle; hence the circulation is called double, and it is also complete, as the whole mass of the blood is purified in the lungs before it is sent over the body. Before birth, when the lungs are impervious, the auricles communicate directly, and one or more vessels pass from the right ventricle to the aorta, conveying the blood over the body without sending it to the lungs; but when respiration begins the communications between the arterial and venous systems are closed. In the dugong the two ventricles are separated by a deep cleft; in some mammals the right auricle receives 3 venæ cavæ; the apex is not inclined to the left, as in man, except in some monkeys, and in some hoofed animals 2 small flat bones are imbedded in the substance of the left ventricle. In cetaceans there is a plexiform arrangement of the arteries of the walls of the chest, allowing an accumulation of blood in them, to be used as required during prolonged submersion; in many ruminants the internal carotid forms a *rete mirabile*, or network of vessels, at the entrance of the skull,

doubtless to prevent injury to the brain from too great force of the blood while the head is in a dependent position; in the slow-moving sloths the arteries of the limbs communicate very freely, rendering compression during their climbing impossible except in a few vessels at a time. A similar disposition prevails in the venous system; in the seal and otter, as in the ducks, the inferior cava is dilated into a receptacle which holds the blood while they are under water, and only permits it to pass on to the lungs when they come to the surface; in the porpoise tortuous sinuses receive the intercostal veins, and in the foot of the horse a fine network is distributed on the front of the coffin bone. The heart is composed of muscular fibres, each cavity having its own, arranged in a spiral manner from the point to the base; the course of the blood is directed from the auricles to the ventricles by the mitral valve on the left side and the tricuspid on the right, kept in place by tendinous cords attached to fleshy columns, and the entrances of the aorta and pulmonary artery are guarded each by 3 semilunar valves which prevent regurgitation. The lungs of mammals are almost always in pairs, and hang freely in the chest suspended by the straight windpipe, and enclosed within the serous cavity lined by the pleura; the air tubes are distributed to all their parts, and the pulmonary cells are minutely subdivided and do not communicate with any other air cells in the body as they do in birds. The windpipe varies much in length, in the number of its rings (which are from 14 to 78), and in their completeness; the cartilages do not generally form a complete circle, being membranous posteriorly, and in the whales the membranous portion is said to be in front. The mechanism of the mammalian respiration has been described under DIAPHRAGM, the muscular partition which separates the thoracic and abdominal cavities in this class.—The voice, under the control of the will, is produced by the passage of air from the lungs over certain organs in the larynx or upper portion of the windpipe; in man the larynx is a short and wide tube, suspended as it were from the hyoid bone, formed of cartilaginous plates, called the thyroid, cricoid, and 2 arytenoid cartilages; the prominence commonly called "Adam's apple" is the anterior surface of the thyroid cartilage. The mucous membrane forms 2 lateral folds from before backward, like the lips of a button hole, the vocal cords or ligaments; above these are 2 other folds, between which and the vocal cords is a cavity on each side, the ventricle of the larynx; the space between these 4 folds is the glottis, which is covered above, during the passage of food or drink, by a fibro-cartilaginous tongue, the epiglottis. In ordinary respiration the air passes noiselessly; but when the will contracts or otherwise modifies these cords, sound is produced, which in man becomes articulate speech by the action of the pharynx, nasal passages, and parts contained within the mouth. The epiglottis exists in all mammals, but it is

sometimes divided at the upper end; in cetaceans, the larynx ascends to the posterior nares and communicates with the blow-hole on the top of the head. The lion's loud roar depends on the great size of the larynx; the grunt of the hog is produced in cavities communicating with its ventricles; the neigh of the horse by vibrations of folds connected with the vocal cords; the bray of the ass by reverberation in a large cavity with small aperture under the thyroid cartilage; in the howling monkeys the hyoid bone is dilated into a bony pouch, and each ventricle opens into a large membranous sac, in which the loud sounds of these animals are produced; in the marsupials the voice is very weak.—The urinary system of mammals consists of secretory organs (the kidneys), and a reservoir for the secreted fluid (the bladder), communicating with the former by the ureters and externally by the urethra. The kidneys of mammals present the same external cortical and internal tubular portions as in man, and also the supra-renal capsules, in the lumbar region near the vertebrae and external to the peritoneal sac; they differ somewhat in form, being more or less lobulated, as in the human fetus, in cetaceans, seals, otters, bears, the elephant, and ox; the lobules vary from 10 in the otter to 180 in the seals, in cetaceans resembling a bunch of grapes; in all, except the monotremata, the ureters open into the bladder—in these into the urethra, as in chelonians. The bladder is generally more loosely connected in mammals than in man; it is largest in the herbivora, smaller and more muscular in carnivora and rodents. The chemical composition of the urine is about the same in carnivora as in man, except in the absence of uric acid; in the herbivora it is alkaline, containing hippuric acid and much earthy carbonate. In the stage, below the inner angle of the eye, there is an opening communicating with a large membranous pouch, from the glands of which is secreted a brownish liquid, flowing down the sides of the face, like tears; many animals have glands on the abdomen, in the groins, or about the genito-anal openings, whose secretion is very odorous, as in the musk deer, beaver, civet, and skunk.—The special internal male organs are the testes, which secrete the sperm, with certain accessory glands (as the prostate and Cowper's), and seminal receptacles or *vesiculae*; in the female the germs are formed in the ovaries, whence they escape through the Fallopian tubes into the uterus, and thence when full-grown externally; as the name mammal imports, they have also external glands for the secretion of milk, the *mammae* or breasts. The testes may be permanently external, as in the dog—always abdominal, as in the seal, elephant, and cetaceans—or external during the rutting season, and at other times internal, as in the mole and porcupine. The epididymis is usually largely developed; the seminal vesicles are found in monkeys, bats, rodents, and pachyderms, but are wanting in carnivora, most plantigrades, ruminants, and marsupials; the prostate gland ex-

ists in some form in all mammals; the absence of Cowper's glands in most pachyderms, rodents, and carnivora, shows that their action is not essential to reproduction. The human ovaries are 2 oval, glandular bodies, about an inch long, in the posterior portion of the broad ligaments; each contains about 20 Graafian vesicles, enclosing an ovum. All the internal organs, except the uterus, are much alike in the other mammalia. This last organ, single in the monkeys, is in carnivora, many rodents, pachyderms, ruminants, and cetaceans, generally divided at the base into 2 horns (*corua*), each sometimes having its distinct opening; in marsupials the ovaries are more or less racemose, as in birds. In most mammals, after the fecundated ovum has descended through the Fallopian tube (in the higher orders about the 12th day), an intimate vascular connection takes place between the sinuses of the parent and the chorion of the fetus, forming the placenta, which continues to supply the young with nutriment until it is capable of an independent existence. The period of utero-gestation, about 270 days in the human mammal, varies in the different families. This group of placental mammals has been called monodelphians to distinguish them from the didelphians, which include the marsupials and monotremata; the former have a more perfect brain, with its hemispheres united by a *corpus callosum*; the latter bring forth their young in a very imperfect condition, but have the brain destitute of a corpus callosum, the abdominal walls supported in front by 2 bones arising from the pubis, and an external pouch for the reception of the young. Prof. Jeffries Wyman ("Proceedings of the Boston Society of Natural History," vol. vi. p. 368), from the examination of a large number of fetal pigs, has shown that the above division of mammals into "placentals" and "implacentals" is not well defined; he found that in pigs there is, strictly speaking, no placenta, the maternal and fetal vessels being in relation only by means of very minute diffused villi and slight foldings of the chorion; this condition is intermediate between those of marsupials and ruminants, and shows such a gradual transition in this respect that the former must be brought nearer than has been usually admitted to ordinary mammalia. Mammary glands exist in both sexes, but serve for purposes of lactation only in the female; the number is generally in relation with the number of the young at a birth; there are 2 in monkeys, the elephant, the goat, and the horse; 4 in the cow, the stag, and the lion; 8 in the cat; 10 in the hog, rabbit, and rat; and 12 or 14 in the agouti. The position also varies; in monkeys and bats they are on the chest, in most carnivora on the chest and abdomen, and in the ruminants far back between the posterior limbs; in marsupials they are concealed within the abdominal pouch. Some mammals are born with the eyes open, and are at once able to run in search of food; many, however, are born

with the eyes closed and in a very weak condition; and a few, as the marsupials, leave the uterus in such an imperfect state that they would perish did not the parent place them in her pouch, where they complete their development, each suspended to a teat. In the monotremata (*ornithorhynchus*, &c.), which seem to form the connecting link between mammals and birds, in addition to the horny bill, cloaca, and bird-like ovaries, there are the form, external covering, skeleton, and milk-secreting glands of the mammals.—As to physical distribution, some mammals dwell entirely in the sea, as the cetaceans and most seals; some of the latter and the sirenoid pachyderms (manatee, &c.), live chiefly in fresh water; others, beavers, muskrats, the *ornithorhynchus*, &c., frequent rivers and lakes; but most live upon the land, some on mountains like the chamois and ibex, some on plains like the antelopes and bison, some on trees like the apes, squirrels, and sloths; others sail or fly in the air like the flying lemur and the bats, and others live under ground like the moles. For these different methods of progression and habits of life, the limbs are variously adapted by modifications of the same few osseous elements, evincing not only the wisdom and power of the Creator, but the existence of a divine plan according to which the mammalian as well as the other vertebrate classes have been developed. The study of fossil mammals shows that the same plan was followed in past geological ages, beneficently modifying animal organisms to suit the necessary functions and the changes in external conditions. Most naturalists have until recently believed that the appearance and existence of mammal and all animal and vegetable specific forms were due to special acts of creative power; but Mr. Darwin, in his remarkable work on the "Origin of Species" (1860), has maintained that the various forms of mammals (and he carries the argument throughout animated nature) have arisen by a process of natural selection and gradual improvement for countless ages from a comparatively few and perhaps a single mammalian type, itself possibly a development by similar stages from a primary animal monad. To what extent Mr. Darwin's theory may be true, the investigation and collection of many facts must hereafter determine; the present and past geographical distribution of mammals, the remarkable transition types in this and all classes, the authentic facts of natural and artificial effects of change, with the acknowledged imperfection of the geological record, show that the questions of origin and development can by no means be considered as settled beyond dispute. The study of the geographical distribution of mammals shows that the number of genera and species increases from the poles to the equator, with the exception of the whales and seals, which are most numerous in the polar regions; within the northern arctic circle there are species common to both hemispheres, as the arctic fox, white bear, reindeer, and ermine; in temperate North America the species are different from those of the east-

ern hemisphere, and in South America even the genera from those of the old world, as those including the peccary, llama, armadillo, ant-eater, sloth, cavy, agouti, vampire bat, marmoset, the howling and prehensile tailed monkeys; the raccoon and muskrat are exclusively American; the hog, horse, camel, rhinoceros, elephant, lion, tiger, lemurs, and anthropoid apes belong now to the eastern world; the giraffe, hippopotamus, chimpanzee, and most of the antelopes, are African; all the marsupials (except the American opossums) and the monotremata are Australian, while the stags, squirrels, cats, bears, dogs, and bats are absent from this region. The marsupials, though forming scarcely $\frac{1}{10}$ of the land animals in the world, constitute $\frac{1}{4}$ of the mammalian fauna of New Holland; exclusive of cetaceans and seals, the rodents form $\frac{1}{4}$ of the entire number of species of the world, the bats and carnivora $\frac{1}{4}$, the remaining third being chiefly the monkeys, ruminants, marsupials, and insectivora, according to Van der Hoeven; in Europe, wanting marsupials and monkeys, the rodents are $\frac{1}{3}$, bats $\frac{1}{4}$, and insectivora about $\frac{1}{5}$; in North America the species of rodents form perhaps half the entire number of land mammals; the large pachyderms, edentates, and the apes belong to the warm regions, most of the latter being African; the insectivora are almost peculiar to the northern hemisphere, and the lemurs are most common in the southern. The connection between animals and plants is well illustrated in the mammalian class; Mr. Darwin, in the 8d chapter of his work above alluded to, mentions the connection of the Scotch fir and grazing cattle, and of insect pests in Paraguay with the wild herds of cattle and horses; the introduction of a feline animal preying upon field mice, which in their turn devour the combs and nests of humblebees, would enable these insects freely to fertilize the tri-colored violet and the red clover in their visits to these flowers, and in this way a single cat in a district might greatly influence its vegetation. Excepting the whales and bats, mammals do not migrate, but spend the summer and winter in the same locality; the whales pass the summer in the polar regions, and come southward in winter into the lower Atlantic. The phenomena of hibernation or winter-sleep in mammals have been described under the former title.—MAMMALOGY includes the classification of mammalia. The mammalia were first separated from other 4-footed animals by Aristotle, who called them *scotoka* or viviparous animals; he divided them into 3 sections according to their locomotive organs: 1, *dipoda*, or bipeds; 2, *tetrapoda*, or quadrupeds; 3, *apoda*, impeds or whales. The quadrupeds, including all but man and the cetaceans, he subdivided into 2 great groups according to the modifications of the organs of touch, in the first of which the ends of the digits are left free for the sense of feeling, the nail being on the upper surface only, and in the second the feet ending in hoofs, corresponding respectively to the wa-

guiculata and *ungulata* of Ray. The ungulates he divided by the teeth into 3 families: 1, those with cutting incisors and triturating or flattened molars, like the apes (*pithecoida*) and the bats (*dermaptera*); 2, those with canine or carnivorous teeth, *carcharodonta* or *gampsonucha*; 3, those corresponding to the rodents, with the negative character of the absence of canine teeth. The ungulate or hoofed quadrupeds he divided, according to the organs of motion, into: 1, *polyschida* or multungulates, like the elephant; 2, *dischida* or bisulcates, including the ruminants (*merykizonta*) and the hogs; and 3, *aschida*, or solidungulates, like the horse. The apodal quadrupeds included the cetaceans or *ketoda*. It thus appears that Aristotle clearly perceived the principles upon which mammals are classified by the best modern naturalists.—This arrangement was not improved upon until John Ray published his *Synopsis* in 1693 in London, and his improvements relate to the 4-footed mammals. In his ungulate quadrupeds he places the solipedous (as the horse), the bisulcate ruminants (like the ox and stag) or non-ruminants (as the hog), and the quadrisulcate (rhinoceros and hippopotamus); in the ungulate the feet are either bifid (as in the camel), or multifid with digits adhering together (as in the elephant), with distinct depressed digits (as in apes), or compressed (as in carnivora, insectivora, rodentia, and edentates).—Linnaeus founded his primary divisions on the locomotive organs, deriving his orders from the modifications of the teeth; in his earlier editions of the *Systema Naturæ*, up to the 10th, he called the class *quadrupedia*, including the cetaceans among fishes; in his 12th edition (1766) he makes 7 orders, as follows: A. *Unguiculata*: I., *primates*, with 4 front cutting teeth, including man, the monkeys, and bats (4 genera); II., *bruta*, with no front teeth in either jaw, including the elephant, walrus, and edentates (6 genera); III., *fera*, with front teeth, conical and long canines, including the carnivora, opossum, and insectivora (10 genera); IV., *glires*, with 2 front cutting teeth in each jaw, including the rodents (6 genera). B. *Ungulata*: V., *pecora*, with cutting front teeth in the lower jaw, but none in the upper, including the ruminants (6 genera); VI., *bellua*, with obtuse front teeth in both jaws, including the pachyderms generally (4 genera). C. *Mutica*: VII., *cete*, with horny or bony teeth, pectoral fins instead of feet, and horizontal flattened tail, including the cetaceans (4 genera). He thus made 40 genera in all. Linnaeus followed Ray in placing the elephant among the *unguiculata*, an error avoided by Aristotle.—Pallas divides mammalia into the following 7 orders: 1, *fera*, corresponding to the carnivora of later authors; 2, *semifera*, to the *primates* of Linnaeus, with the opossum and insectivora; 3, *glires*, or rodents; 4, *ruminantia*, the *pecora* of Linnaeus; 5, *anomalaopoda*, the pachyderms exclusive of the proboscideans; 6, *bellua*, the proboscideans, exclusive of the walrus; and 7, *cetacea*, including whales, the mana-

tee, and walrus. Klein in 1751 divided mammals into 2 orders, those which have the feet terminated by hoofs, and those which have claws or fingers. In 1756 Brisson made 18 orders and 42 genera. Erxleben in 1777 gave excellent descriptions of species, adding 10 genera to those of Linnaeus.—In 1798 Cuvier published his *Tableau élémentaire des animaux*, in which he laid down the basis of his classification, which was variously modified until the 2d edition of his *Règne animal* in 1829; in that work he makes the 9 following orders of mammalia: *bimana*, *quadrumana*, *carnivora*, *marsupialia*, *rodentia*, *edentata*, *pachydermata*, *ruminantia*, and *cetacea*. In his 1st edition the marsupials were ranked among carnivora, and in the *Tableau élémentaire* there were 8 grand divisions: I., *unguiculata*, with the orders *bimana*, *quadrumana*, *cheiroptera*, *plantigrada*, *carnivora*, *pedimana*, *rodentia*, *edentata*, and *tardigrada*; II., *ungulata*, with the orders *pachydermata*, *ruminantia*, and *solipeda*; and III., *mutica*, with the orders *amphibia* and *cetacea*.—The systems of Blumenbach, Illiger, and Desmarest differ little from that of Cuvier, except in the names of the orders and their subdivisions. Blumenbach in 1807 made the 9 orders of *bimana*, *quadrumana*, *cheiroptera*, *digitata*, *solidungula*, *bisulea*, *multungula*, *palmata*, and *cetacea*. Illiger in 1811 saw fit to change long established names for his 14 orders, with 40 families and 125 genera; his orders are: I., *erecta*, with the family of man; II., *pollicata*, with 5 families of apes, monkeys, lemurs, and most marsupials; III., *salientia*, with 2 families of the other marsupials, including the kangaroo; IV., *premsiculantia*, with 8 families of the rodents; V., *multungula*, with 6 families of the pachyderms; VI., *solidungula*, with the horse family; VII., *bisulea*, with 4 families of ruminants; VIII., *tardigrada*, with the sloth family; IX., *effodientia*, with 2 families of edentates; X., *repantia*, with the family of monotremata; XI., *volitantia*, with 2 families of flying lemurs and bats; XII., *falculata*, with 4 families of carnivora; XIII., *pinnipedia*, with the seal family; and XIV., *natantia*, with 2 families of herbivorous and carnivorous cetaceans. Desmarest in his *Mammalogie* (1820-'22) describes, exclusive of man, but with many fossil animals, about 850 mammals, of which the *quadrumana* are 141, the *cheiroptera* 97, the *fera* 176, the *marsupialia* 47, the *rodentia* 149, the *edentata* 24, the *pachydermata* 55, the *ruminantia* 97, and the *cetacea* 62; of these, 880 are herbivorous, 150 insectivorous, 240 carnivorous, and 80 omnivorous. De Blainville (1822) makes in the type *osteozoa*, or vertebrates, the sub-type *vivipara* and the class *pilifera* or *mammifera*, with the divisions *monadelphya* and *didelphya*. Temminck (1827) makes the 11 orders of man, monkeys, bats, carnivora, marsupials, rodents, edentates, pachyderms, ruminants, cetaceans, and monotremata. Fischer, in his *Synopsis Mammalium* (1829), makes the 9 orders of pri-

males (man and monkeys), *chiroptera* (bats), *fera* (carnivora), *bestia* (insectivora and marsupials), *glires* (rodents), *bruta* (edentates and monotremata), *bellua* (pachyderms and solipeds), *pecora* (ruminants), and *cete* (herbivorous and ordinary cetaceans).—McLeay (1821), the founder of the quinary classification, makes 5 orders of mammals, which may be arranged in a tabular form as follows:

| Mammals. | Characters. | Birds. |
|----------------------|------------------------------------|----------------------|
| 1. <i>Fera</i> . | Carnivorous. | <i>Raptorea</i> . |
| 2. <i>Primates</i> . | Omnivorous. | <i>Insectores</i> . |
| 3. <i>Glires</i> . | Frugivorous. | <i>Raiores</i> . |
| 4. <i>Ungulata</i> . | Frequenting the vicinity of water. | <i>Grallatores</i> . |
| 5. <i>Cetacea</i> . | Aquatic. | <i>Natatores</i> . |

This shows the analogies between mammals and birds, in regard to food and habits, which were afterward modified by Swainson (in 1835), as follows: I., typical group, *quadrumania*, organized for grasping, analogous to insessorial birds; II., sub-typical, *fera*, with retractile claws and carnivorous, to the *raptores*; III., aberrant group, including *cetacea*, eminently aquatic, with very short feet, to *natatores*; *glires*, with lengthened and pointed muzzle, to *grallatores*; and *ungulata*, with crests on the head, to *raiores*. He makes about 1,200 quadrupeds, which he arranges in these orders according to their natural affinities, thus: the order *quadrumania* includes the apes and monkeys and bats; the *fera* include the carnivora, opossums, insectivora, and seals; the *cetacea* are both herbivorous (manatee) and carnivorous (dolphins and whales); the *ungulata* comprise the pachyderms, edentates, ruminants, and solipeds; and the *glires* the rodents and herbivorous marsupials.—Oken in 1802 divided animals into 5 classes according to the organs of sense; this view is elaborated in his "Physiophilosophy" (Ray Society edition, 1847); of these 5 classes the 5th and highest is the *ophthalmozoa* or mammalia, so called because in them the eyes are movable and covered with 2 perfect lids, the other sense organs having however suffered no degradation; he also calls them *thricozoa* or pilose animals on account of their hairy covering, and æsthetic or sensorial animals from the completion and combination of all the organs of sense. They belong to his province of *sarcosoa* or flesh animals. His divisions are as follows: A. *Splanchno-thricosoa*. Order I., rodents, with the families: 1, infusorial *thricosoa* (rats); 2, polyary (squirrels); and 3, acalephan (hares). Order II., edentates and marsupials, with families: 4, mussel-like *thricosoa* (sloths); 5, snail-like (herbivorous marsupials); and 6, kraken (carnivorous marsupials). Order III., insectivora and chiroptera, with families: 7, worm *thricosoa* (moles); 8, crustaceous (shrews); and 9, ptilotal (bats). B. *Sarco-thricosoa*. Order IV., *ungulata*, with families: 10, ichthyoid *thricosoa* (whales); 11, reptilian (pachyderms); and 12, ornithic (ruminants). C. *Æsthesio-thricosoa*. Order V., *unguiculata*, with families: 13, dermal *thricosoa* (carnaria); 14, lingual (seals); 15, nasal (bears), and 16, aural (apes); and 17,

ophthalmosoa or man, at the head of all. Every family of the *thricosoa* contains 5 genera, in accordance with the 5 organs of sense; the human family or genus has also 5 varieties on the same principle: 1, the skin man, the black African; 2, the tongue man, the brown Australian and Malay; 3, the nose man, the red American; 4, the ear man, the yellow Mongolian; and 5, the eye man, the white European.—Another philosophical system is that of Cuvier. The mammals are made the 7th class of his 8d circle, the *cephalozoa*. He makes 10 orders, as follows: 1, *natantia*, or herbivorous and carnivorous cetaceans, with evident relations with fishes; 2, *reptantia*, or monotremata and edentates, related to reptiles; 3, *volitantia*, bats and flying lemurs, related to birds; 4, *mergentia*, seals and walrus, a repetition of the 1st; 5, *marupialia*, a repetition of the 2d; 6, *glires* or rodents, a repetition of the 3d; 7, *pachydermata*, a 2d repetition of the 1st; 8, *ruminantia*, a 2d repetition of the 2d, indicated by the 5th, which is half ruminant; 9, *fera*, a 2d repetition of the 3d; and 10, *quadrumania*, having relations with man.—The fundamental idea of the classification of Fitzinger (1843) is the same as that of Oken, the class mammalia having 5 series, according to the development of the organs of sense, and each series 3 orders, viz.:

| TOUCH. | TASTE. | SMELL. |
|-------------------------|----------------------------|-------------------------|
| <i>Cetacea</i> . | <i>Pachydermata</i> . | <i>Edentata</i> . |
| 1. <i>Balanodea</i> . | 1. <i>Phocina</i> . | 1. <i>Monotremata</i> . |
| 2. <i>Delphinodea</i> . | 2. <i>Ossa</i> . | 2. <i>Lipodonta</i> . |
| 3. <i>Sirenia</i> . | 3. <i>Eumnantia</i> . | 3. <i>Turdigrada</i> . |
| HEARING. | VISION. | |
| <i>Unguiculata</i> . | <i>Primates</i> . | |
| 1. <i>Glirea</i> . | 1. <i>Chiropteri</i> . | |
| 2. <i>Bruta</i> . | 2. <i>Hemipitheci</i> . | |
| 3. <i>Fera</i> . | 3. <i>Anthropomorphi</i> . | |

—Of the embryological systems of classification may be mentioned those of Von Baer, Van Beneden, and Vogt. Von Baer (1828) proposed the following division of this class of his doubly symmetrical or vertebrate type, with osseous skeleton, lungs, an allantois, and an umbilical cord: the cord may disappear early, 1, without connection with the mother (*monotremata*), or 2, after a short connection with the mother (*marupialia*); or the cord may be longer persistent, 1, the yolk sac continuing to grow for a long time, the allantois growing little (*rodentia*), moderately (*insectivora*), or much (*carnivora*), or 2, the yolk sac increasing slightly, the allantois growing little and the umbilical cord very long (monkeys and man), continuing to grow for a long time and the placenta in simple masses (ruminants), or growing for a long time and the placenta spreading (*pachyderms* and *cetaceans*). According to Vogt (1851), mammals may be arranged in 2 divisions: I., *aplacentaria*, with the orders *monotremata* and *marupialia*; and II., *placentaria*, with series 1, composed of the orders *cetacea*, *pachydermata*, *solidungula*, *ruminantia*, and *edentata*; series 2, of the orders *pinnipedia* and *carnivora*; and series 3, of the orders *insectivora*, *volitantia*, *glirea*, *quadrumania*, and *bimana*. Van Beneden (1855), in

the class *mammalia* of his *hypocotyledones* or *hypovittellians* (vertebrates), in which the vitellus or yolk enters the body from the ventral side, establishes the 10 orders *primates*, *cheiroptera*, *insectivora*, *rodentia*, *carnivora*, *edentata*, *proboscidea*, *ungulata*, *strenioidea*, and *cetacea*.—We will add a few other classifications deserving of mention. Prince O. L. Bonaparte (Rome, 1831) gives a tabular arrangement as follows: Class I., *mammalia*, sub-class *quadrupeda*: section 1, *unguiculata*, with the 7 orders *primates*, *cheiroptera*, *fera*, *pinnipedia*, *marsupialia*, *glires*, and *bruta* (edentates); section 2, *ungulata*, with the orders *pecora* and *bellua*;—sub-class *bipeda*, with the order *cete*. Class II., *monotremata*, with the orders *tachyglossa* (echidna) and *platypoda* (ornithorhynchus). He makes in all 1,188 species. In a supplement (1832) he calls the second sub-class *cete*, and divides it into the orders *sirenia* and *hydraula*. Straus-Durckheim (1843) gives 19 orders, *bimana*, *quadrumania*, *plantigrada*, *carnivora*, *marsupialia*, *cheiroptera*, *rodentia*, *edentata*, *pachydermata*, *ruminantia*, *amphibia*, and *cetacea*. Milne-Edwards (1855), in his allantoïdian sub-branch of the *osteozoaria* or vertebrates, divides the class *mammalia* into: I., *monodelphya*: 1, *propria*, with orders *bimana*, *quadrumania*, *cheiroptera*, *insectivora*, *rodentia*, *edentata*, *carnivora*, *amphibia*, *pachydermata*, and *ruminantia*; 2, *pisiciformia*, with the order *cetacea*;—II., *didelphya*, with the orders *marsupialia* and *monotremata*. Van der Hoeven (1856) makes 2 sections of *mammalia*: I., *acotyledona* with the orders: 1, *monotremata*, and 2, *marsupialia*;—II., *placentalia*, with orders: 3, *cetacea*; 4, *pachydermata* (divided into the proboscidean, perissodactyle, and artiodactyle phalanxes); 5, *ruminantia*; 6, *edentata*; 7, *glires*; 8, *fera*; 9, *cheiroptera*; 10, *ptenopleura* (flying lemur or *galeopithecus*); 11, *quadrumania*; and 12, *bimana*. Baird (in vol. viii. of the "Pacific Railroad Survey," 1857) adopts the following arrangement: A, *unguiculata*, with the orders: 1, *quadrumania*; 2, *cheiroptera*; 3, *rapacia*; 4, *marsupialia*; 5, *rodentia*; and 6, *edentata*;—B, *ungulata*, with orders: 7, *solidungula*; 8, *pachydermata*; and 9, *ruminantia*;—C, *pinnata*, with orders: 10, *pinnipedia*; and 11, *cetacea*. All of these, except the 1st, are found in North America; the horse, though not existing native, formerly was an inhabitant of this country. Agassiz, in his essay on classification (1857), makes mammals the 8th class of vertebrates, with only the 8 orders of *marsupialia*, *horbiroa*, and *carnivora*.—Owen (in the article "Mammalia" in the "Cyclopædia of Anatomy and Physiology," 1847) admits in the sub-class of *placentalia* the 10 orders of *bimana*, *quadrumania*, *cheiroptera*, *insectivora*, *carnivora*, *cetacea*, *pachydermata*, *ruminantia*, *edentata*, and *rodentia*, and in the sub-class *implacentalia* the orders *marsupialia* and *monotremata*; the monkeys by the *galeopithecus* are connected with the *cheiroptera*, and by the lemurs with the *carnivora*; the last

by *otaria* are related to *cetacea*, which in turn have certain affinities with the fishes; the rodents are connected with ruminants by the musk deer; the *monotremata* lead to reptiles. Before introducing the most recent classification of mammals by Prof. Owen, according to the cerebral system, the reader should be reminded that until the time of Cuvier the principal subdivisions were based upon the Aristotelian characters derived from the organs of locomotion, the secondary groups being established on the peculiarities of the dental system; Cuvier added others drawn from the osseous and generative systems; De Blainville in 1816 first adopted the division, according to the method of reproduction, into monodelphs, didelphs, and ornithodelphs, or ordinary mammals, marsupials, and monotremes, retaining for the most part the Linnæan orders. Classification by the placenta seems to have been first proposed by St. Everard Home, but, as modified by successive naturalists, leads to many unnatural affinities—placing, for instance, rodents and insectivora with monkeys, and solipeds, pachyderms, and some ruminants with the carnivorous cetaceans. Prince Bonaparte, in his *Systema Vertebratorum* (1840), adopts the division of *placentalia* and *implacentalia*, subdividing the first into the sub-classes of *educabilia* and *ineducabilia*, the latter including the orders *bruta*, *cheiroptera*, *insectivora*, and *rodentia*, with the common character of a single-lobed cerebrum; this Prof. Owen regards as the most important improvement since the establishment of the natural character of the ovo-viviparous or implantal division. In 1845 Isidore Geoffroy St. Hilaire raised the marsupials to the rank of a distinct class, making its subdivisions orders equivalent to those of the *placentalia*; Owen, however, did not regard them as groups of equal rank and value. In 1849 Prof. Owen, from the consideration of the times of formation and the succession of the teeth, divided mammals into 2 groups, monophyodonts, or those which generate a single set of teeth (as the *monotremata*, *bruta*, and *cetacea*), and the diphyodonts, or those which generate 2 sets of teeth (comprising the great bulk of the class); at the same time he wished it to be clearly understood that this dental character is not so associated with other organic characters as to indicate natural or equivalent sub-classes. As early as 1842 he drew attention to the value of the principal modifications of the mammalian brain in regard to their association with concurrent modifications in other systems of organs; it was not until 1857, however, that he felt himself justified in proposing to the Linnæan society a fourfold division of this class, based upon the four leading modifications of the cerebral structure. His first and lowest group or sub-class is called *lyncephala*, signifying the loose or disconnected state of the cerebral hemispheres, which leave exposed the olfactory ganglia, the cerebellum, and more or less of the optic lobes, have the surface gener-

ally smooth, and the anfractuositie, when present, few and simple; in this division the absence of the corpus callosum commissure is associated with the marsupial mode of development and the non-development of the placenta; it includes the monotremes and marsupials. The next stage in the development of the brain is where the corpus callosum is present, but the hemispheres leave the olfactory lobes and cerebellum exposed, and are commonly smooth or with few and simple convolutions; these are the *lissencephala*, or smooth-brained mammals, or rodents, insectivora, bats, and edentates, in many respects, in common with the preceding subdivision, resembling birds and reptiles. The third modification is an increased relative size of the hemispheres, which extend over more or less of the cerebellum and olfactory lobes, and have their surface, except in a few of the lower *quadrumana*, folded into more or less numerous *gyri* or convolutions; hence this sub-class is called *gyrencephala*; among these are not found marks of affinity with the ovipara, but the highest mammalian perfection is attained,

as shown by the size, strength, activity, sagacity, and docility of many of its members; this sub-class comprises the other orders of mammalia, man only excepted. In man the hemispheres overlap the olfactory lobes and cerebellum, extending in advance of the former and further back than the latter; in man only is there what is called a 8d or posterior lobe, and in him the superficial gray matter attains its highest development through the number and depth of its convolutions; as representing a distinct sub-class of mammalia, and ruling naturally over all the other members of the class, he proposes for man the name of *archencephala*, signifying that he is master of the earth and of the lower creation. For details on the characters of the secondary groups and their distribution in time and space, the reader is referred to the original paper in the "Proceedings of the Linnæan Society" of London, vol. ii. pp. 1-87, 1857. As his tabular arrangement is the latest and in many respects the best, and as it is not generally accessible to students, it is reproduced here entire. It is as follows:

| Class. | Sub-class. | Order. | Family or genus. | Example. |
|---------------|---------------|----------------|------------------------|------------|
| MAMMALIA. | ARCHENCEPHALA | BIMANA | <i>Homo</i> | Man. |
| | | | <i>Catarrhina</i> | Ape. |
| | Ungulculata | QUADRUMANA | <i>Platyrrhina</i> | Marmoset. |
| | | | <i>Strepsirrhina</i> | Lemur. |
| | | | <i>Digitigrada</i> | Dog. |
| | | CAENIVORA | <i>Plantigrada</i> | Bear. |
| | | | <i>Pinnigrada</i> | Seal. |
| | GYRENCAPHALA | ARTIODACTYLA | <i>Omnicoora</i> | Hog. |
| | | | <i>Ruminantia</i> | Sheep. |
| | | PERISSODACTYLA | <i>Solidungula</i> | Horse. |
| | | | <i>Multungula</i> | Tapir. |
| | | PROBOSCIDA | <i>Elephas</i> | Elephant. |
| | | | <i>Dinotherium</i> | Extinct. |
| | Mutilata | TOXODONTIA | <i>Toxodon</i> | " |
| | | | <i>Nesodon</i> | " |
| | | SIRENIA | <i>Manatus</i> | Sea cow. |
| | | | <i>Halocoera</i> | Dugong. |
| | | CEUTAGRA | <i>Delphinida</i> | Porpoise. |
| | | | <i>Balanida</i> | Whale. |
| | | | <i>Bradypodida</i> | Gloth. |
| | | BRUTA | <i>Dasypodida</i> | Armadillo. |
| | | | <i>Edentula</i> | Ant-eater. |
| | | CHEIROPTERA | <i>Frugivora</i> | Boumsetta. |
| | | | <i>Insectivora</i> | Bat. |
| | | | <i>Talpida</i> | Mole. |
| LISSENCEPHALA | INSECTIVORA | | <i>Erinacida</i> | Hedgehog. |
| | | | <i>Sorrida</i> | Shrew. |
| | RODENTIA | | <i>Non-claviculata</i> | Hare. |
| | | | <i>Claviculata</i> | Rat. |
| | MARSUPIALIA | | <i>Phisophaga</i> | Wombat. |
| | | | <i>Poipphaga</i> | Kangaroo. |
| | | | <i>Carpophaga</i> | Phalanger. |
| | LYENCEPHALA | | <i>Eniomophaga</i> | Opossum. |
| | | | <i>Echidna</i> | The same. |
| | | MONOTREMATA | <i>Ornithorhynchus</i> | " |

The fossil mammals must be considered, before the student can form an idea of the affinities of the class; these and the orders of existing mammalia will be treated under their respective titles. The mammalian class has existed certainly from the lower eolitic period, and probably from the triassic; during this immense lapse of time genera and species have changed, either that they have been newly created at the several epochs, or, as Darwin maintains, have been modified by processes of natural selection, many original and intermediate forms having become extinct, and, from the imperfection of the geological record, as yet having afforded no indication of their exist-

ence. None of the mammalian genera of the secondary epoch have been found in the tertiary ones; no genus of the older eocene has been discovered in the newer; very few eocene genera have been found in the miocene, and none in the pliocene; many of the miocene genera are peculiar to that division, and some indistinguishable from existing species begin to appear only in the newer pliocene; while the perissodactyles and omnivorous artiodactyles have been gradually dying out, the true ruminants have been increasing in genera and species. One class of organs seems to govern one order, and another class another order; for example, the teeth, so diversified in marsupials

and edentates, are remarkable for the constancy of their characters in rodents and insectivora; as a general rule, the characters from the dental, locomotive, and placental systems are more closely correlated in the *gyrencephala* than in the 2 inferior sub-classes. (See also a lecture before the university of Cambridge in May, 1859, by Prof. Owen, "On the Classification and Geographical Distribution of Mammalia," London, 1859.)

MAMMARY GLANDS, the organs which secrete the nutritive fluid, milk, by which the young of man and the mammalia are nourished during the early periods of life. They vary from 2 in the human female to 10 or 12 in the lower mammals, and may be pectoral as in the former, or pectoral and abdominal, or only abdominal, as in the latter. Each gland is made up of a number of separate glandules, more or less closely connected by fibrous tissue and fat, and bound down by the same to the pectoral or abdominal muscles. The lactiferous tubes arising from the minute ultimate follicles of the lobules terminate in the mamillary tubes of the nipple, 10 or 12 in the human female, straight but of variable size; at the base of the nipple, and extending into the gland, are reservoirs for containing a constant supply during lactation; these are often much larger in the lower animals than in woman. The skin covering them is very delicate and smooth; the colored circle around the nipple is called the *areola*, which becomes darker during and after gestation; the irregular surface of the nipple is covered with a very sensitive skin, and much erectile tissue enters into its substance. The tubes are lined with a very vascular mucous membrane, which has its own secretion sometimes in considerable quantity. These glands, especially during lactation, are well supplied with blood from branches of the subclavian and axillary arteries; their nerves come from the brachial plexus and the intercostals. The inner surface of the follicles is covered with a layer of epithelium cells, the real agents in the secreting process. They present no great difference in size in the sexes until near the age of puberty, when a considerable enlargement takes place in the female; from the increased supply of blood during gestation, there is a sense of tenderness and distention which is one of the earliest and most valuable signs of pregnancy. These glands in the male are miniatures of those of the female, but the essential structure is the same, as is shown by the authentic cases of infants suckled by men; a mucous fluid may frequently be pressed from the male nipple. Though the functional activity of these glands is naturally limited to the period succeeding parturition, their secretion is sometimes seen in virgins and in aged women, in whom a strong desire to furnish milk and a continued irritation of the nipple by the infant's mouth have stimulated the organs to unnatural activity; similar facts are known in men and the males of lower mammals. The permanent secretion of milk

in domestic cows is a modified function of the action of these glands, resulting from an artificial habit continued through many generations; in the extensive herds of South America the secretion of milk, from the non-interference of man, is an occasional phenomenon, according to Roulin, continuing as in other animals only during the suckling of the young. The presence of these organs has given the name to the *mammalia*, the highest class of vertebrated animals, implying a mode of intra-uterine and extra-uterine development not found in birds, reptiles, or fishes. Physiologically these glands belong to the generative system, and are gradually removed from the caudal to the pectoral region, as we ascend from cetaceans to the human female, in whom the helplessness of the infant becomes the means of the moral training of the mother; the forward, outward, and upward direction of the nipples is exactly adapted to the position of the child lying in its mother's arms, and the greater abundance of the lactiferous tubes at the lower portion of the breast forms a soft cushion for its head to rest upon. In the African and sometimes in other races, after lactation, the skin covering the breasts becomes so lax, and the organs so elongated, that they can be thrown over the shoulders like bags. The mammary glands are subject to many painful and dangerous diseases, among which may be mentioned acute and chronic inflammations, abscesses, and encysted, fibrous, and cancerous tumors; they are sometimes enormously overloaded with fat.

MAMMEE APPLE (*mammea Americana*, Linn.), a handsome tree of 60 feet in height, native of the Caribbean islands and the neighboring continent. It has large, oval or obovate, shining, leathery, opposite leaves, white, sweet-scented flowers, and large, round, obsoletely 3 or 4 cornered fruit, about the size of a cannon ball. The fruit is covered with a double rind; the outer is leathery, tough, and brownish yellow; the inner, thin, yellow, closely adhering to the flesh, which is firm, bright yellow, and of a singular pleasant taste and a sweet aromatic smell; but the skin and seeds are very bitter and resinous. It is eaten alone, or cut up into slices with wine and sugar, or more commonly prepared as a jam or marmalade, or with sirup. From the yellowness of the pulp, like that of an apricot, it is called by the French *abricot sauvage*. The bitterness of the kernel is employed to impart a flavor to noyau and other cordials. The tree belongs to the natural order of *guttifera*. Browne ("Natural History of Jamaica," London, 1756) speaks of the species as among the largest trees of Jamaica, and esteemed among the best timber trees. It has been observed that no one can behold this tree towering above a cluster of fruit trees without a sentiment of respect for it. There is an African species (*M. Africana*), which grows to a large tree on the mountains of Sierra Leone, and which produces excellent fruit. Two or three other species are known to botanists.

MAMMOTH, or **MAMMONT**, the fossil elephant of Siberia (*elephas primigenius*, Blumenbach), found in the diluvial strata of Europe and Asia, and perhaps also in North America. Large fossil bones were alluded to by Theophrastus, Pliny, and many ancient authors, and were generally supposed to be the remains of giant men. They are abundant in the drift of central and northern Europe, mingled with bones of other pachyderma, principally in river basins; in Great Britain in the Kirkdale cavern of Yorkshire; in Sweden and Norway, but most abundantly in the frozen region of European and Asiatic Russia, about the mouths of rivers descending into the icy sea; there is indeed hardly a river in Siberia in whose bed or on whose banks these remains have not been found, as well as in the neighboring plains, in connection with bones of other animals now strangers to the climate; they are not found in the elevated districts. In Siberia fossil ivory is so abundant and so well preserved that it gives rise to a considerable traffic both for home and foreign use. The inhabitants explain this by the following fable: they believe that the soil of Siberia is undermined by gigantic animals, living like moles, and unable to endure the light of day; these animals they call mammoth or mammont, either from the Tartar *mamma* (signifying earth), or the Arabic *behemoth* (a large animal), often added by the Arabs to the name of the elephant; the tusks are the supposed horns of the animals, which were formerly so valuable that the czars reserved for themselves the monopoly of the trade; this fable is current over the greater part of northern Asia, and especially China. The most remarkable discovery in relation to the mammoth was the occurrence of a carcass found by a Tungoose fisherman in a block of ice on the border of the Arctic sea in 1799, near the river Lena; in the course of a few years this immense mass was thawed out, and it was found to be an elephant having the flesh and soft parts well preserved, with the exception of such portions as had been devoured by bears, dogs, and other carnivorous animals; the tusks were very fine, weighing 800 lbs., and were removed by the fisherman. In 1806 Mr. Adams, travelling for the museum of St. Petersburg, visited the locality and collected the remains, which were transported to St. Petersburg, where the skeleton now is, in a nearly perfect condition; he ascertained that the skin had an abundant covering of hair and wool, indicating that it was fitted to resist a cold climate. From this it is evident that the climate of Siberia during the diluvial period was not like that of the regions now inhabited by elephants; it must have been moderately cold, though such as would permit the growth of a vegetation more luxuriant than any in the present arctic regions, and sufficient for the nourishment of these bulky animals. Another more recently discovered specimen allowed even a microscopic examination of the tissues. The following are the differences between the fossil and living elephants, as deter-

mined by Cuvier. In the former the laminae of the teeth are narrower and more numerous than in the Indian elephant, which they most resemble, with the lines of enamel more slender and less festooned, and the teeth absolutely and relatively wider. The tusks are larger than in most living specimens, and generally more curved, but the structure is the same. In the skull, there is much greater length and perpendicularity in the sockets for the tusks; the head is more elongated, with a greater development of occiput, and concave and nearly vertical forehead; the long alveoli must have modified the trunk, and have given the animal a different physiognomy from that of the present elephant; the antero-posterior length of the lower jaw is less, the lower molars are parallel instead of converging forward, and the jaw is truncated in front instead of having a projecting grooved symphysis. The bones of the limbs are more massive, and the usual distance between the two condyles of the femur is reduced to a narrow line. The skin is like that of the living elephant, but is covered with hair of 3 kinds; the longest, 12 or 15 inches, is brown and like horse hair; the shorter, 9 or 10 inches, is more delicate and fawn-colored; and the wool at the base of the hair, 4 or 5 inches long, is fine, smooth, fawn-colored, and a little frizzled toward the roots; there is a mane on the neck, and the whole covering is well suited for a cold climate. The mammoth has never been found living, nor have any of the existing elephants been discovered in the fossil state; it was probably not much if at all higher than the elephants of the present epoch, but was stouter, more clumsy, and heavier. Their bones are found mingled with those of the rhinoceros, ox, antelope, horse, often with marine animals, and sometimes with fresh water shells. They were undoubtedly overwhelmed by a comparatively recent and sudden catastrophe during some portion of the long drift period, accompanied by a depression of temperature, and probably by a subsidence of the land and an invasion of the sea, general over the northern regions of both hemispheres; during the preceding tertiary epoch there was an elevation of temperature, permitting tropical animals to go far to the north; this temperature gradually became colder, the animals becoming adapted for it, as shown by their external covering, until they suddenly became extinct during the glacial period of the drift. From the abundance of the remains found in Siberia, it is inferred that elephants were more numerous during the diluvial epoch than at the present time. To the *E. primigenius* belong the Siberian fossils, and most, if not all, of those of the drift of Europe.—Several species of fossil elephant have been found in North America, referred by some to the *E. primigenius*. Prof. H. D. Rogers ("Proceedings of the Boston Society of Natural History," vol. v., Feb. 1, 1854) drew attention to the fact that while the European mammoth is found in the drift stratum, the North American fossil elephant is imbedded in strata above the drift,

of a distinctly more recent age, and was a contemporary of the *mastodon giganteus*, their bones being found together in the marshy alluvium of Big Bone Lick; he maintains that they lived together in the long period of surface tranquillity which succeeded the strewing of the general drift (the period of the Laurentian clays), and were overtaken and exterminated together by the same changes, partly of climate, partly of a second but more local displacement of the waters which reshifted the drift, and formed the later lake and river terraces. In the pliocene deposits of Kansas and Nebraska Dr. Hayden found bones of mastodon and elephant (*E. imperator*, Leidy), and a similar coexistence has been ascertained in the pliocene of Europe; their remains have been found in Kentucky, Texas, Mexico, Spanish America, and even as far as the arctic circle. The elephants of the tertiary sub-Himalayan Sivalik hills have been described by Cautley and Falconer; in these the dental laminae are so separated that each forms the summit of a ridge, making a transition from elephant to mastodon, constituting the genus *steodon* (Cautley and Falconer). The mammoths of the American continent are now generally admitted to be different species from those of Europe and Asia.—For details on the mammoth, see Cuvier's articles in vol. viii. of the *Annales du muséum*, and in vol. i. of the *Ossemens fossiles*; Pictet's *Traité de paléontologie*, vol. i.; and vol. v. of the "Naturalist's Library," which treats of the pachyderms.

MAMMOTH CAVE. See CAVE, vol. iv. p. 718.

MAN. See ANATOMY, ANTHROPOLOGY, COMPARATIVE ANATOMY, ETHNOLOGY, MAMMALIA, PHILOSOPHY, and PHYSIOLOGY.

MAN, ISLE OF (Manx, *Mannin*, or *Ellan Vannin*; anc. *Monapia*, or *Monarina*), an island belonging to Great Britain, in the Irish channel, about midway between England, Scotland, and Ireland, its centre lying in lat. 54° 16' N., long. 4° 30' W.; length, N. N. E. and S. S. W., 31 m.; breadth from 8 to 12 m.; area, 209 sq. m.; pop. in 1851, 52,116. The coasts are very irregular, and on the E. and S. W. are precipitous. There are numerous bays with good anchorage. A ridge of mountains traverses the length of the island, culminating in Mt. Sneafeld at an elevation of 2,086 feet above the sea. Its prevailing geological formation is clay schist, varied on the E. side with large masses of granite. The principal rivers are the Sulby, Neb, Silverburn, Dhu, and Laxey, all of which are very small. The climate is mild and equable, the mean temperature of summer being 59° F. and of winter 41.57°. The mineral resources of the island consist of lead and copper, which are extensively mined, silver, which is extracted from the lead ore in the proportion of 20 oz. to the ton, lime, marble, granite, rotten stone, ochre, and white spar. The soil is fruitful, and agriculture is in a forward state. Oats, barley, wheat, turnips, and hay are the principal crops. A native breed

of small sturdy horses, an inferior kind of sheep, horned cattle, and pigs in great numbers, are among the domestic animals. The island possesses a breed of cats having either no tail, or at most a merely rudimental substitute for it. Sea birds and some rare kinds of fish are also found. The fisheries of herring, &c., are the principal reliance of the islanders, though some activity has recently been displayed in manufactures. The government is vested in the queen in council, the governor, and the "house of keys" (see OLAVES INSULÆ), whose concurrence is necessary to give validity to every law; and the acts of the British parliament do not affect the isle of Man unless expressly extended to it. The governor is appointed by the crown and assisted by a council of officers. Beside the ordinary civil and ecclesiastical courts, there are ancient tribunals called "deemsters' courts," the judges of which, called deemsters, are chosen by the people, one for the N. and another for the S. division of the island, and possess very extensive authority. Questions relating to the herring fishery are tried before an officer called the water bailiff, who also appoints two fishermen called admirals to preserve order among their fellows.—The island was originally peopled by the Manx (*Menavia*), a Celtic tribe, whose language, a sub-dialect of the Gallic or Celtic, forming one branch with the Erse and Irish, is still spoken in the N. W. and W., though English is generally understood. The island was held for some time as a feudal sovereignty by the earls of Derby, and afterward by the dukes of Athol, from whom the sovereignty and revenues were purchased by the crown in 1765 for the sum of £70,000, to which an annuity of £2,000 was subsequently added. In 1829 the duke's remaining interests in the island, including the manorial rights and patronage of the see, were sold to the crown for £418,114. Chief towns, Castletown (the capital), Peel, Douglas, and Ramsay.

MAN-OF-WAR BIRD. See FRIGATE BIRD.

MANAGUA, a city and the nominal capital of Nicaragua, situated on the S. shore of the lake of the same name, in lat. 12° 14' N., long. 86° 48' W.; pop. about 12,000, for the most part proprietors of the fertile lands which surround it, and which are productive in all tropical staples. Owing chiefly to the rivalries of the cities of Granada and Leon, and partly to its central position, it has been selected as the place of meeting of the legislative chambers. The offices of the government are, however, in Leon.

MANAGUA, LAKE, a beautiful body of water in Nicaragua, 50 m. long by from 80 to 85 m. wide, elevated 186 feet above the Pacific ocean, from which it is separated by a ridge of land 18 m. broad in its narrowest part. It has a depth of water varying from 2 to 40 fathoms. It has an outlet at its S. extremity called Rio Tipitapa, connecting it with Lake Nicaragua through the Estero de Panaloya. The difference of level between the two lakes, at average stages of water, is 28 feet 6 inches. The Rio Tipitapa,

during severe rainy seasons, passes a considerable body of water; but it is often completely dry, the evaporation from the surface of the lake exceeding the supply of water from its tributaries. In the various projects for an interoceanic communication through Nicaragua, it has been proposed to connect the two lakes by means of a canal, deepening the Estero de Panaloya and constructing a series of locks to the superior lake, with another canal from the lake to the port of Tamarinda or of Realijo, or by means of the Estero Real to the bay of Fonseca. Between the N. portion of the lake and the Pacific there is only the magnificent plain of Leon, having an elevation at its highest part of about 50 feet above the level of water in the lake. The volcano of Momotombo projects boldly into the lake at its N. extremity, and within the lake itself rises the island cone of Momotombita, which had a sacred reputation among the aborigines, and still contains numbers of their idols and other monuments, concealed beneath the shadows of its dense forests. The city of Leon was first built on the shore of the N. W. extremity of the lake, at a place called Moabita, abandoned for the present site in 1610.

MANAKIN, the name applied to the denterostral birds of the family *ampelidæ* or chatters and sub-family *piprina*; they are generally small and of brilliant colors, and with one exception inhabitants of the warmer parts of South America. They have a moderate or short bill, depressed, with broad base, curved ridge, compressed sides, and toothed tip; the nostrils are hidden by the frontal feathers; the wings generally short and pointed; tail short and even; tarsi moderate and slender; toes long, the outer united to the middle to beyond the 2d joint; claws acute. The red manakin or chatterer (*phainicercus carnifex*, Swains.) is about 7 inches long; the crest, lower back, rump, lower belly, thighs, and vent, bright crimson; rest of plumage dull red, dusky on the back; tail crimson, with end and outer web dusky brown; the female is of a general greenish olive color, with tinges of red on the head, abdomen, and tail; the young birds are brownish with whitish markings. This and the *P. nigricollis* (Swains.) inhabit the eastern parts of tropical South America.—The blue-backed manakin (*pipra parvula*, Linn.) is 4½ inches long; the plumage is black, with the back and lesser wing coverts blue, and a crest of bright crimson feathers; the female and young are greenish. The long-tailed manakin (*P. caudata*, Shaw) has the body blue, crest crimson, and wings black, and the two middle tail feathers extend about one inch beyond the rest and are of a blue color. The black-capped manakin (*P. manacus*, Linn.) is black above, beneath white, with a spot on the neck and wings white. The red and black manakin (*P. aureola*, Linn.) has the head, neck, throat, and breast crimson, and the rest of the plumage black with a steel gloss, the middle of the belly reddish, a white spot on the wings, and beneath them yellow. There are more

than 80 other species. These beautiful and active birds inhabit damp woods, on the borders of which they live in small flocks, seeking for insects and fruits.—The rock manakins belong to the genus *rupicola* (Briss.), of which the best known species is the orange manakin or cock of the rock (*R. crocea*, Bonn.); the plumage is saffron orange, with the quills partly white and partly brown, and the wing coverts loose and fringed; it has a singular crest of feathers arranged in 2 planes, arising from the sides of the head and meeting over and in front of the bill; the size is that of a small pigeon. This handsome species inhabits rocky places near the borders of the streams in Guiana, and its legs and feet are nearly as stout as in a gallinaceous bird of the same size, whence its common name; it is active and suspicious, feeding on fruits and berries; the nest is placed in holes in the rocks, composed of roots, grass, and earth, lined with finer materials; it lays 2 white eggs, about the size of those of a pigeon; it is now comparatively rare, as it is hunted for the beauty of its plumage. There is a species in Peru (*R. peruviana*, Lath.), of a reddish saffron color, with black quills and tail, and ashy wing coverts; it is a little larger than the other.—The only old world representative of this sub-family belongs to the genus *calyptomena* (Raffles), found in the thick forests of Java and Sumatra; the plumage is shining green, with a spot on each side of the nape, 8 oblique stripes on the wings, and the quills, except the outer margins, dark-colored. The only species described by Gray is the green manakin (*C. viridis*, Raffl.), about 6 inches long; the color so nearly resembles the foliage of the high trees upon which it generally perches, that it is very difficult to see and to procure; its food is entirely vegetable.

MANASSEH. I. One of the two sons of Joseph, son of Jacob, adopted by the latter on his deathbed to become the head of one of the tribes of Israel. On the conquest of Palestine, half of the tribe received its allotment from Moses E. of the Jordan, N. of Gad, and the other half from Joshua W. of the Jordan, between Issachar on the N. and Ephraim on the S., the Mediterranean forming the W. boundary. The eastern division contained among others the districts of Ituræ, Trachonitis, Galanitis, Batanæa, and part of Gileaditis, and the towns of Gadara, Ashtaroth, Edrei, Gamala, Jabesh Gilead, Mahanaim, and Gerasa. The western division was less important in history, it being almost always overshadowed by its southern neighbor, Ephraim. II. A king of Judah. (See **HEBREWS**, vol. ix. p. 85.)

MANATEE, **LAMANTINE**, or **SEA COW**, a large aquatic mammal (*manatus*, Cuv.), arranged by Cuvier among cetaceans, forming with the dugong the herbivorous group of this order, the family *sireniæ* of Illiger. Recently, on account of their many important differences of organization, they have been approximated to the pachyderms; their proper position is probably in an order which may be called *sirenoids*, in-

intermediate between pachyderms and true cetaceans. The manatee has the elongated, fish-like body of the whales, the anterior limbs flattened into fins, the posterior limbs wanting and only represented by a rudimentary pelvis, and the tail oval, about $\frac{1}{2}$ of the extent of the body, ending in a flattened, horizontal, rounded, caudal expansion; in these respects it resembles cetaceans. Its principal pachyderm affinities are: the separation of the cervical vertebrae; the smaller total number in the whole column, and the absence of osseous disks between the bodies; the articulation of the ribs to 2 vertebral bodies and to transverse processes; the long and narrow scapula; the regularly shaped humerus; the rounded radius and ulna; the compact structure of the phalangeal bones; the wide separation of the occipital condyles, and their partly horizontal position, and the large size of the occipital foramen; the well marked and strong sutures, and the absence of internal bony falces; the fusion of the parietals into one; the position of the frontals as usual in front of the parietals; the strong zygomatic arches; the symmetry of the cranial bones and their usual position; the shape of the jaws, and the character of the molars; and the structure of the stomach and heart. Many other distinctions are given in the "Proceedings" of the 8d meeting of the American association for the advancement of science, Charleston, S. C., 1850 (pp. 42-47). The head is conical, without distinct line of separation from the body; the fleshy nose much resembles that of a cow, the nostrils opening as usual on the end of the snout; the full upper lip has on each side a few bristly tufts of hair; the mouth is not large, and the eyes are small; the openings of the ears are very small. The swimming paws are more free in their motions than in cetaceans, and may be used also for crawling up the muddy banks of the rivers in which they dwell; the separate bones may be felt through the skin, and the fingers are provided with small nails. The skin is of a grayish black color, becoming black on drying, with a few scattered bristles. In the young animal there are 2 sharp incisor teeth in the upper jaw, which afterward fall out; there are no canines; the molars are generally $\frac{3}{4}$ - $\frac{1}{2}$, with quadrangular flat crowns, divided by a transverse groove. The bones are dense and heavy, differing in this from cetaceans; the ribs are numerous and rounded; the mammae are 2 and pectoral; the intestinal canal is 10 or 12 times the length of the body, in accordance with the vegetable character of their food; the stomach has 2 caecal appendages in the pyloric portion, which is separated from the cardiac by a constriction. They inhabit the sea shores, especially about the mouths of rivers, and the rivers themselves, keeping near the land, feeding upon algae and aquatic plants; they do not feed upon the shores, though they sometimes quit the water, and not unfrequently support themselves in the shallows in a semi-erect position; under these circum-

stances they present at a distance somewhat of human appearance, increased by the distinct lips, the long whiskers in the males and the pectoral mammae in the females. The largest and best known species is the Florida manatee (*M. latirostris*, Harlan), which inhabits the gulf of Mexico, the West Indies, and the shores of Florida; it attains a length of 15 or 20 feet, but is generally about 12. They are usually seen in small troops, associating for mutual protection and for the defence of their young; they are harmless even when attacked, of gentle disposition, not afraid of man, and rarely quarrelling with each other. Being found only in shallow waters, they are easily captured by the natives, who kill them with harpoons, lances, and arrows, for the sake of their flesh, which is wholesome and palatable. The South American manatee (*M. australis*, Wiegman), usually 9 or 10 feet long, is not uncommon about the mouths of the great rivers of northern Brazil and Guiana; it ascends the streams several hundred miles, and even into inland fresh water lakes; the flesh of this aquatic mammal is considered fish by the Roman Catholic church in Brazil, and may consequently be eaten on fast days; salted and dried in the sun, it is an excellent meat; the oil from the blubber is of fine quality, and free from smell; the hide is made into harnesses and whips, and is noted for strength and durability. An African species (*M. senegalensis*, Desm.) is rarely more than 9 feet long. The manatees are all tropical, but are not found in the Pacific and Indian oceans, their place being there taken by the allied dugongs (*halicore*, Illiger).—There is among the Russians an animal called the northern manatee or sea cow; this is the creature described by Steller, forming the genus *rhytina* (Ill.) or *Stelleria* (Cuv.). This, the *R. Stelleri* (Desm.), was unknown before 1741, when Behring's second expedition was wrecked on an island in the straits bearing his name; its flesh formed the principal food of the shipwrecked mariners for nearly a year; one of the party, M. Steller, described the animal, and his account was published in St. Petersburg, and probably contains all that will ever be known concerning it, as in 1768 the crews of the ships in pursuit of sea otters had entirely exterminated it; it has met the fate of the dodo, but at a much more recent period; a skull and a few fragments are said to exist in European museums. It had no teeth, the jaws being covered with an undulating surface of horny tubular matter; the head was small, the body covered with a thick, fibrous, fissured epidermis, and the caudal fin lunate. It attained a length of 25 feet, and formerly lived in the neighborhood of Behring's island on the coast of Kamtschatka. The epidermis had a singular structure, being composed of perpendicular horny tubes, sometimes an inch in length, of a blackish brown color, rough and wrinkled like the bark of a tree, and so tough as to be with difficulty cut with an axe; it served to protect the animal

from the ice and sharp rocks among which it fed. They lived in shallow water in troops, the older protecting the younger; they were harmless and very tame, and strongly attached to each other; they fed on fuci under water, and the skin, fat, and flesh were esteemed by the natives. The fossil dinotherium belonged to this sirenoid class of mammals.

MANAYUNK, a town of Pennsylvania, on the left bank of the Schuylkill, and on the Philadelphia and Norristown railroad, included in the chartered limits of the consolidated city of Philadelphia, and 7 m. from the state house; pop. in 1850, 6,158. Extensive water power is afforded by the waste water of the Schuylkill canal, and there are large manufactories of cottons, jeans, and woollen goods. It contains 6 Protestant and 2 Roman Catholic churches. The river is here crossed by 2 bridges.

MANBY, **GEORGE WILLIAM**, an English officer, born in Hilgay, Norfolkshire, Nov. 28, 1765, died in Southtown, near Great Yarmouth, Nov. 18, 1854. He was educated at the military college of Woolwich, and became in 1803 barrack master at Great Yarmouth. Here, his attention having been drawn to the calamities which resulted, in cases of shipwreck, from the difficulty of establishing communication with the shore, he attempted casting a rope from the shore to the wreck by the agency of gunpowder. The great problem to be solved in this operation was the maintenance of the connection between the rope and the mortar during its transmission. Chains were unable to stand the shock of the discharge, but stout strips of raw hide closely platted together were found to answer; and on Feb. 12, 1808, the entire crew of the brig Elizabeth, wrecked within 150 yards of the beach, were rescued by the simple contrivance of Capt. Manby. In 1810 his invention was brought before a committee of the house of commons, and having been favorably reported on, he received a grant of money, and all the dangerous stations on the British coasts were supplied with his apparatus. He also contrived a pyrotechnic which renders vessels visible from shore on the darkest night; and shells filled with luminous matter, to enable the crew to perceive the approach of the rope, in the manufacture of which he suggested several improvements. Capt. Manby received altogether from the British government, as the reward of his inventions, about £7,000. He published the "History and Antiquities of the Parish of St. David, South Wales" (1801), and kindred works; also "Journal of a Voyage to Greenland in 1821" (1822); and a number of writings relative to shipwrecks and to his various inventions.

MANCHA, **LA**, an old province of Spain in the S. part of New Castile, now forming the principal part of the modern province of Ciudad Real; area, 7,500 sq. m.; pop. 250,000. The N. and S. portions are mountainous, and the centre in general a desolate sandy plateau. The towns are few and uninteresting; the cottages in the villages are built of mud. The country

is denuded of trees, exposed to the wintry blasts, and scorched by the summer heat. The earth is arid and stony; the dust is impregnated with saltpetre, and the glare of the sun almost blinds the eye. Water is wanting, and dry dung is used for fuel. In some places, however, corn, saffron, and wines are produced; and the mules of La Mancha are celebrated. The native of the country is jovial, honest, industrious, brave, and temperate. The scenery of La Mancha has become celebrated by the descriptions of Cervantes in "Don Quixote."

MANCHE, **LA**, a N. W. maritime department of France, in the old province of Normandy, bounded W. and N. by the English channel, E. by the same and the departments of Calvados and Orne, and S. by Mayenne and Ille-et-Vilaine; area, 2,291 sq. m.; pop. in 1856, 595,202. The coast is in some parts rocky and precipitous, but is indented with several excellent harbors, the principal of which are Cherbourg, La Hogue, and Granville. La Manche has several short but navigable rivers, the principal of which is the Vire, and is traversed from N. to S. by a hilly range of moderate height, called Cotentin, which slopes gradually toward the sea on each side. The rest of the surface is in general undulating, the soil rich, and the climate moist and mild. The quantity of cider annually made exceeds 22,000,000 gallons. A considerable portion of the land is under pasturage. The horses of La Manche are considered the best in France. Iron, lead, and coal are mined, and granite, marble, slate, and limestone are quarried. Salt is largely manufactured on the coast; and in the towns there are manufactories of iron, zinc, copper, woollen, and cotton. Capital, St. Lô.

MANCHESTER, a city and one of the shire towns of Hillsborough co., N. H., situated mostly on the E. bank of the Merrimack river at the falls of Amoskeag, 18 m. S. S. E. from Concord, and 59 m. N. W. from Boston; pop. in 1838, about 50; in 1850, 18,933; in 1860, about 22,000. It was first settled in the neighborhood of the falls about 1730, incorporated under the name of Derryfield in 1751, and named Manchester by act of the legislature in 1810. It received a city charter in 1846. The city is regularly laid out in squares, and the main street is 100 feet wide, planted with elms on each side at intervals of 40 feet for more than a mile. There are 5 public squares of liberal extent, 3 of them having ponds of water. Manchester is the terminus of the Merrimack and Connecticut rivers railroad, and the Manchester and Lawrence railroad. The Concord railroad passes directly through it to Boston. The villages of Amoskeag and Piscataquag are on the W. side of the Merrimack, and were annexed to the city from Goffstown and Bedford in 1855. They have communication with the city by two free bridges.—The rise and importance of Manchester are owing to the manufacturing facilities afforded by its position, the fall in the river being 54 feet in the space of one mile, giving an available

hydraulic power for machinery of the most powerful and extensive kind. The following table shows the principal manufacturing establishments in 1859:

| Name. | Incorporated. | Capital. | Hands employed. | Articles made. |
|--|---------------|-------------|-----------------|--|
| Amoskeag New Mills..... | 1881 | \$3,000,000 | 3,200 | Cottons. |
| " Paper Mills..... | ..... | 40,000 | 24 | Paper. |
| " Machine Shops..... | 1881 | ..... | 500 | Locomotives, &c. |
| Stark Mills..... | 1888 | 1,250,000 | 1,250 | Cottons and bags. |
| Manchester Print Works..... | 1889 | 1,800,000 | 1,980 | Cottons and woollens. |
| " Gas Light Company..... | 1850 | 100,000 | 25 | Gas. |
| " Edge Tool Manufacturing Company..... | 1858 | 100,000 | 85 | Axes, adzes, &c. |
| " Iron Company..... | 1858 | 150,000 | 60 | Castings. |
| " Machine Company..... | 1858 | 300,000 | 40 | Scales. |
| " Locomotive Works..... | 1854 | 100,000 | 200 | Locomotives, other engines, and tools. |
| Total..... | | \$6,840,000 | 7,364 | |

Of the hands employed, 2,622 are males and 4,742 females. The quantities of the principal articles manufactured yearly are: cottons and woollens, 46,680,000 yards; bags, 2,080,000; paper, 320 tons; locomotives, 90; edge tools, 25,000; castings, 950 tons. The principal kinds of cotton, woollen, and mixed goods are ticks, denims, flannels, sheetings, drillings, de laines, barèges, prints, Persian cloths, and cassimeres. The Blodgett paper mill and Manchester car and machine works suspended in 1857, and have not since resumed operations.—The city contains 14 churches, viz.: 2 Baptist, 2 Congregational, 1 Episcopal, 1 Freewill Baptist, 3 Methodist, 1 Mission chapel, 1 Presbyterian, 1 Roman Catholic, 1 Unitarian, and 1 Universalist. There are 40 public schools, comprising 1 high school, 2 grammar, 1 intermediate, 18 mixed, 8 middle, and 15 primary. The Catholics have a primary school for boys and girls, and "Mount St. Mary's Academy" for the education of young ladies, under the care of the sisters of mercy. The New Hampshire school for the reformation of juvenile and female offenders against the laws is situated on the E. bank of the Merrimack, about 1½ m. N. from the city hall. It is well built of brick, and can accommodate 150 inmates. The "Manchester Athenæum," founded by individuals in 1844, with a library, museum, and reading room, was transferred to the city in 1854 to form the foundation of a public library. In 1856 a fire occasioned the loss of 5,400 volumes. In 1859 it contained 6,500 volumes. There are 5 weekly and 2 daily newspapers, 4 banks of discount with a collective capital of \$750,000, and 8 savings banks.

MANCHESTER (anc. *Mancunium*), the most important manufacturing city in Great Britain, and the second in population, situated in the S. E. corner of Lancashire, on both sides of the river Irwell, in lat. 53° 29' N., long. 2° 14' 28" W., distant by railway 197½ m. N. N. W. from London, 85 m. N. from Birmingham, and 81½ m. E. by N. from Liverpool; pop. in 1851, 401,321; in 1860, estimated at over 500,000. The city consists of Manchester proper and the townships of Ardwick, Beswick, Bradford, Cheetham, Chorlton-upon-Medlock, Harpurhey, Hulme, and Newton, on the E. bank of the Irwell; and of the borough of Salford, composed of Broughton, Pendleton, and Salford, on the W. bank. Eight bridges connect the two towns,

which, though having separate municipal governments, really constitute but one. The Irk and Medlock flow into the Irwell on the Manchester side, and are crossed by several small bridges. The city contains about 800 streets, mostly lighted with gas and generally well paved. They are intersected by numerous canals crossed by about 80 bridges. A portion of the place still presents an antiquated appearance with its old houses and narrow streets; and while the latter characteristic attaches to some of the modernized part, there are many handsome streets, such as Market street, Portland place, Grosvenor square, Mosley street, George street, King street, Ardwick green, Salford crescent, &c. There are several handsome public parks and gardens, of which the most important are the botanical and horticultural garden, the Peel park, on the Irwell, with an area of 32 acres, the Queen's park, Phillips park, and the Bellevue and Pomona gardens; the two latter in private hands, where, in addition to a zoological exhibition in one and a floral exhibition in the other, public concerts and balls are given throughout the summer. The buildings devoted to business and manufactures have generally a very substantial and frequently an imposing appearance. There are nearly 200 places of public worship, of which in 1855 10 were Baptist, 49 Church of England, 22 Independent, 17 Methodist Association, 9 Methodist New Connection, 8 Primitive Methodist, 10 Roman Catholic, 5 Scotch Presbyterian, 5 Unitarian, and 29 Wesleyan. The parish church, erected by Lord Delaware in 1422, and since 1848, when Manchester became a bishopric, the cathedral, is a highly ornamented Gothic structure, now being repaired and beautified, 216 feet long and 120 wide. Of many other handsome churches, one of the finest is St. John's cathedral, Roman Catholic, in Salford, an elegant cruciform structure, with a spire 200 feet high. The town hall, in King street, is in the Grecian style, and contains a hall 180 feet long by 38 feet wide, having its walls and dome covered by allegorical frescoes. The exchange, one of the finest buildings of the kind in the kingdom, has an elegant Doric portico and a splendid commercial room, 185 feet long by 92 feet wide, with 2 rows of fluted Ionic columns, lighted by a lofty glazed dome. In the upper part is a library of 80,000 volumes. The corn exchange is an

Ionic structure capable of holding 2,400 persons. The new free trade hall, somewhat irregular but large and effective, occupies the site of the old free trade hall, noted in the history of Manchester as the place of several important free trade meetings. The new building occupies an area of 20,700 square feet; it contains a hall 128 feet long and 78 feet wide, with an area of 9,594 feet, and estimated to afford accommodation for 8,156 persons, and with the galleries for 4,000. There are beside various rooms for concerts, supper, cards, billiards, &c. Its front is 75 feet high. There are various other notable public buildings, court halls, gaols, the blind and the deaf and dumb asylums, and the royal infirmary, established in 1752. The last named edifice is one of the most ornamental in the town. It is in Piccadilly, built on 8 sides of a quadrangle, each with a portico supported by 4 fluted Ionic columns, the whole surrounded with grass borders and walks, with a sheet of water in front. A colossal statue of Sir Robert Peel faces the building. Among scientific, literary, and art associations are the royal Manchester institution, occupying buildings which cost £40,000, and devoted to the exhibition of paintings, lectures, &c.; the mechanics' institution, founded in 1825, for which a new edifice was erected in 1856, established for the instruction of the working classes, male and female, in the principles of the arts they practise and in other branches of useful knowledge; a school of design, founded in 1838 for the purpose of imparting instruction in design as variously applied to the arts, to provide lectures on painting, sculpture, anatomy, &c., to form a library of books and engravings, and a museum for the exhibition of casts, models, designs, paintings, mechanical inventions, and other works of arts; also natural history, botanical and horticultural, geological, statistical, and medical societies. There are many public libraries, of which two are free, viz: the free library, so called, founded by voluntary subscription and maintained by a municipal rate, and that attached to Chetham's hospital, or the "college" as it is now simply called, an institution founded in 1651 by Humphrey Chetham, for the education of poor boys. Owen's college, founded in 1851 by the munificence of a merchant of the city, who bequeathed for the purpose a property amounting to £100,000, is in connection with the university of London. In 1853 it had 99 students. Beside the colleges there are the free grammar school founded by Hugh Oldham, bishop of Exeter, in 1515-'25, the royal Lancasterian school, and several national schools in which instruction is almost or quite gratuitous. Manchester supports two theatres, and a large concert hall. It is supplied with water from a "gathering ground," about 24 m. distant, of nearly 20,000 acres. The reservoirs form a series of 10 artificial lakes of a capacity of 600,000,000 cubic feet. The pure water only is supplied to the city, the turbid water being collected in separate reservoirs and used for mill purposes. The water is conveyed

in aqueducts 12 m. to Godley, thence to two reservoirs at Denton, and thence 4 m. to Manchester. The works are capable of furnishing 25,000,000 gallons daily, and their cost was about £1,500,000. Manchester is the centre of a great system of canals, and has railway communication with nearly all parts of England.—The name of the town has from a very remote period been connected with industry and trade; but its present great importance is especially due to the magnitude of its cotton manufactures, the greatest in the world. It is mentioned as having maintained a trade with the Greeks of Marseilles. In 1552 an act was passed for the better manufacture of "Manchester cottons;" and in 1650 its manufactures ranked among the first in extent and importance, and its people were described as "the most industrious in the northern parts of the kingdom." Toward the middle of the last century the supply of cotton goods became unequal to the demand. This stimulated that intellectual activity which ultimately removed the previous apparent limits of human industry beyond the bounds even of conjecture. The machines successively invented by Leigh, Hughes, Arkwright, Hargreaves, and others, had their efficiency vastly increased by the steam engine of Watt. The value of the exports of the cotton industry in 1780 was £355,060; it rose in 1781 to £1,101,457, and in 1856 it had reached upward of £38,000,000. The imports of raw cotton in 1751 were to the amount of 2,976,610 lbs.; in 1780, upward of 6,700,000; in 1800, 56,000,000; and in 1856, 1,000,021,021,000. Connected with the cotton manufacture are many important and extensive branches of industry, such as bleaching, printing, and dyeing works, manufactures of the various materials employed in those processes, and particularly the great establishments for the construction of steam engines and machinery, among which may be mentioned the very extensive works of the Fairbairns. It is also the chief market in the world for the production of cotton yarn or thread, the supply of which passes through the hands of numerous resident foreign merchants, who export it to their respective countries, giving to Manchester in this respect a character quite unique among inland cities. The manufacture of silk and silk goods, and of mixed cotton and silk fabrics, is also largely carried on. The following table, furnished in 1853, gives the latest information concerning the factories and print works:

| Establishments. | Number. | Persons employ'd. | Steam power. |
|---|---------|-------------------|--------------|
| Cotton spinning | 85 | 5,292 | 1,540 |
| Cotton weaving | 65 | 7,709 | 1,061 |
| Cotton spinning and weaving | 42 | 17,356 | 4,706 |
| Woollen and worsted, spinning and weaving | 143 | 80,259 | 7,377 |
| Silk throwing, &c., and small ware | 8 | 290 | 80 |
| Flax spinning | 50 | 7,580 | 580 |
| Print works | 8 | 1,130 | 196 |
| Print works | 35 | 2,965 | .... |
| Total | 338 | 142,964 | 8,185 |

The Manchester exhibition, intended for the display of the art treasures of the kingdom, was opened on May 5, 1857. The idea originated at a meeting of Manchester gentlemen in May, 1856. Public approval immediately encouraged the scheme, and a guaranty fund of £74,000 was raised within 8 weeks. The queen and Prince Albert gave the enterprise their patronage and assistance, and the owners of works of art, with few exceptions, responded cheerfully to the application. A suitable building for the exhibition was erected on a site covering 17 acres in Old Trafford, adjoining the botanical gardens, and about 2 m. from the centre of the city. The structure itself covered an area of 180,000 square feet, and cost over £80,000. The central hall was 632 feet long and 104 feet wide; the side aisles were 432 feet long by 40 feet wide; and a water color gallery at the W. end was 200 feet by 24. The light, which was ample and equally diffused, was in all the halls admitted from the roof. There were exhibited 1,115 paintings, 689 by modern masters, 388 British portraits, 59 cases of miniatures and enamels, 969 water color drawings, 160 specimens of modern sculpture, 260 original sketches and drawings by the old masters, 937 line engravings, 161 mezzotints, 246 etchings, many woodcuts, plain, tinted, and chromo-lithographs, and about 600 photographs. The museum of ornamental art comprised 17,000 articles, remarkable for value, beauty, or rarity. No similar collection made in England ever approached this in extent and value. It remained open a little over 5 months, and was finally closed Oct. 17, 1857. During that period it received 1,335,915 visits. The receipts from all sources were £98,500, and the entire outlay, including the expense of returning the various articles to their owners, was £104,000, being an excess of £5,500, to meet which were the materials of the building, since demolished, estimated as worth about £15,000.—The site of Manchester is mentioned as a chief station of the druids, who had there an altar called Meyne. In A. D. 500 it was an unfrequented woodland. In 620 it was taken by Edwin, king of Northumbria, and shortly after occupied by a colony of Angles. It then passed to the Danes, who about 920 were expelled by the king of Mercia. The charter conferring the privileges of a borough was granted in 1301. Manchester cotton is first mentioned in 1352, by which was meant, however, a coarse woollen cloth woven from unprepared fleece. In 1579 the manor was sold to John Layce, a London cloth-worker, for £3,000, and resold in 1596 to Sir Nicholas Mosley for £3,500. At the time of the civil war it was distinguished for active industry, and suffered much from both parties. On Jan. 8, 1819, a great radical meeting was held at St. Peter's field; and another great meeting, attended by 60,000 persons, on Aug. 16 of the same year, was dispersed by the yeomanry cavalry after killing 8 persons.

MANCHINEEL (*hippomane mancinella*), a poisonous evergreen tree growing wild in the

West India islands and along the shores of the Caribbean sea. It is of the natural order *euphorbiacea*; and the name *hippomane* (Gr. *hippos*, horse, and *manos*, to be mad) is given to the genus from the supposed maddening effect of its juice upon horses. The Greeks applied the name originally to an animal substance. The manchineel tree grows to the height of 80 or 90 feet; it has a smooth brownish bark, and spreads out into many branches. The leaves are about 3 inches long and half as wide, standing on short footstalks; the flowers grow in short spikes at the end of the branches. They are obscure and without petals. The fruit when ripe is of a yellow color, and resembles in size and shape the golden pippin. It is highly poisonous, inflaming the mouth and throat when tasted; and the milky juice which exudes from the wood when this is cut is also exceedingly acrid, blistering the skin it touches and acting like lunar caustic when applied to linen. On account of the beauty of the wood when polished, it is much used for cabinet work. It is stated that before striking the axe into the trees the workmen take care to dry the wood by lighting fires around; and cabinet makers also when working it protect their faces with veils from the poisonous effects of the saw dust and exhalations from the wood.

MANCINI, LAURA BEATRICE OLIVA, an Italian poetess, born in Naples in 1823. She devoted the early part of her life to her invalid father, to whom she was indebted for her education. In 1840 she married, against the wish of her relatives, the jurist Pasquale Mancini, and she wrote a play entitled *Ines* founded upon the romantic circumstances of this alliance, which was performed in Florence in 1845. In 1846 appeared her poem *Colombo al convento della Rabida*, and a volume of miscellaneous poetry. Her husband was implicated in the revolutionary movements of 1848, and she followed him to Turin, where she has since resided. In 1851 she addressed a poem to Mr. Gladstone in gratitude for his revelations in regard to the Neapolitan government; and one of her finest poems was elicited by the death of Gioberti (*L'Italia sulla tomba di Vincenzo Gioberti*, Turin, 1853).

MANCO CAPAC. I. In Peruvian mythology. (See *INCA*.) II. Inca of Peru, killed in 1544. He was the second son of the inca Huayna Capac, the conqueror of Quito, who died about 10 years after the first arrival of the Spaniards, dividing his kingdom between his legitimate successor Huascar and a younger son Atahualpa. The latter, after having made war upon Huascar and put him to death, was himself captured and executed in 1533 by Pizarro, who then set up Toparca, a brother of his victim, as a nominal sovereign, under whose name the conquerors might themselves direct the government. Toparca died within the year, and shortly afterward Manco appeared in the Spanish camp to announce his pretensions to the throne and claim Pizarro's protection. The conqueror received him cordially, and made it his

first care after the taking of Ouzoo to place him on the throne. But it was soon evident that the young prince would be no puppet in the hands of his patron. After in vain petitioning for power to exercise the sovereignty, he withdrew secretly from Ouzoo, but was overtaken, brought back, and imprisoned. Again escaping, he roused the whole nation to arms against the invaders, and appeared before Ouzoo (Feb. 1536) with a countless host of Indians who covered the surrounding hills. He destroyed a large part of the city by fire, and reduced the Spaniards to extremities; but after the siege had lasted over 5 months, he had to draw off most of his followers on account of the scarcity of food, and retired to the fortress of Tambo in the valley of the Yucay. Defeated here by Almagro, and forsaken by most of his warriors, he fled to the Andes, and for several years remained a terror to the Spaniards, hovering over their towns, lying in ambush on the highways, sallying forth as occasion offered at the head of a few brave followers, always eluding pursuit in the wilds of the Cordilleras, and in the event of civil war among the foreigners throwing his weight into the weaker scale in order to prolong their contests. Pizarro attempted to negotiate with him, and sent him rich presents by an African slave. The negro was murdered on the way by some of Manco's men, whether by the inca's order or not was unknown; and Pizarro in revenge caused one of the monarch's wives, a young and beautiful woman, to be tied naked to a tree, scourged, and shot to death with arrows. The Spanish rulers who succeeded Pizarro, down to Blasco Nunez, bore orders from the crown to conciliate the formidable chief, but he refused all offers of accommodation. He was killed by a party of Spaniards belonging to the younger Almagro's faction, who on the defeat of their leader had taken refuge in the Peruvian camp. They were in turn massacred by the Indians, and it is not known on whom the blame of the quarrel should be cast.

MANDAMUS, the name of a remedial writ, belonging to a once extensive class of precepts, which bore the generic name of mandamus. They derived their name from the significant word of the mandatory clause, which, while the writs were framed in Latin, ran: *Nos igitur tibi mandamus, &c.*—"We therefore command you." Their origin is referred to that clause of *Magna Charta* which declares that to no man will the king refuse or delay justice: *Nulli negabimus aut differemus justitiam vel rectum*. At a very early period, the injunction was in form nothing but a letter from the sovereign. Subsequently it became a parliamentary writ, and issued on petition from the king and his council. Now, issuing in the name of the sovereign from the court of king's or queen's bench, the writ is directed to persons, corporations, or courts of inferior judicature, and requires them to do some specific act which belongs to their official duty, or which exact justice demands. As in England the precept proceeds from the

court which immediately represents the king, so in this country the power to grant it is vested in the supreme judicial authority of the state. Not only does it form a branch of that general supervisory control which the sovereign power must possess over tribunals, magistrates, and all indeed who in any sense are invested with public functions; but also, as it was originally contrived to prevent failure of justice and to remedy defects of police, it is to be awarded in cases for which the law affords no specific and adequate remedy, yet where justice requires that there should be one. By the judiciary act, which was framed upon the provisions of the constitution, the U. S. supreme court received power to issue writs of mandamus in cases warranted by the principles and usages of law "to any courts appointed or persons holding office under the authority of the United States." Afterward, however, upon construction of the act, the latter clause was held to be unconstitutional and void, and the supreme court refused to grant the writ to compel the secretary of state to deliver a civil commission alleged to be illegally withheld by him. Under the former clause the jurisdiction of mandamus over the circuit and district courts has been repeatedly exercised. Circuit courts, too, have authority to issue the writ when it is necessary for the exercise of their jurisdiction, as, for example, to compel a district court to proceed to judgment in a case which may be referred to the appellate judicature of the circuit court, or to require a state court to transfer a cause to the circuit court under the acts of congress.—In the several states, the power to award the writ of mandamus generally resides in the highest court, and is exercised at discretion. He who seeks this remedy must show that he is innocent of laches, that he has a clear right in the premises, that there has been a distinct refusal to do that which the petitioner would compel, and finally that he has in the ordinary processes of law no adequate remedy, either by statutory provision, by writ of error, or by indictment. It is for the court to determine whether or not, upon the record, mandamus is the proper remedy, as well as whether the allegations are sufficient to authorize the writ. By the usual practice, the person, body corporate, or tribunal to which the writ is directed, is required to make a return to it. The party at whose instance the writ issued may then either demur to or traverse the material facts of the return. The party making the return may himself demur or traverse, and the issue finally produced is to be tried according to the usual course of procedure. If the applicant maintains the issue, he recovers his costs, and a peremptory mandamus is awarded. In a very clear case the peremptory writ may issue in the first instance. As it is directed to courts, the proper office of the mandamus is to require a tribunal of special, peculiar, or inferior jurisdiction to take cognizance of a case which is properly brought before it. The higher court merely

sets the lower in motion; it bids it exercise the power which is vested in it. It does not presume to revise the decision of the inferior tribunal, nor does it interpose to direct or correct the exercise of any discretionary power which belongs to it. As examples of this jurisdiction, mandamus has been granted to compel the sealing of a bill of exceptions; the granting of a new trial; the amendment of a bill of exceptions according to the truth of the case; or, at suit of a defendant, to require the inferior court to enter judgment upon a verdict, in the regular course of process, in order to enable the defeated party to bring his writ of error. But the writ does not lie to control courts in respect to matters of practice under their rules, or to control an exercise of their discretion, as, for instance, in permitting amendments or in refusing to grant motions. Mandamus often issues to commissioners of highways and supervisors of counties, commanding them to perform the peculiar duties of their office; ordering them, for example, to open a road regularly laid out; to estimate the damages caused by the construction of a railway through the county; or to levy a tax as they were required by law to do for the payment of damages caused by laying out a highway. Corporations, too, are often commanded by this process to do what their constituent acts require, or to admit members to the privileges to which they are entitled upon general principles of right. Thus railway corporations have been compelled to pursue, in crossing rivers, the mode prescribed in their charters, and have been forbidden to obstruct navigation by the location of their track. Mandamus will also be issued to a former town clerk, or to a clerk of a county, or to a treasurer of a religious society, requiring him to deliver to his successor the common seal, and the books, papers, and records of the corporation. So it has been directed to the proper officers or body of a corporation, commanding them to restore a member who has been disfranchised without notice or opportunity to make his defence; to admit as a member one who is entitled to become such; and to permit a director to inspect the corporation books. As a remedy for the enforcement of mere private rights of property, mandamus is restricted to cases for which there is no adequate remedy by action in the due course of the common law. A private individual can have the writ only when he has some particular interest to be subserved or right to be pursued or protected by aid of this process, independent of that which he holds in common with the public at large. He therefore cannot claim mandamus to compel a public board to perform an omitted duty unless he is directly injured by the non-performance. Yet such an application from a private individual might perhaps be entertained if the public prosecuting officer had refused to act. It has been lately held in New Jersey that a supreme court has no power to award mandamus either to compel the execution of any duty enjoined on the

executive by the constitution, or to direct the manner of its performance.

MANDANS, a tribe of Indians in the territories of the United States, whose principal village was on the Missouri in lat. 47° 20' N. They are now extinct, having all died of the small pox within a few years. They were a branch of the Dacotahs, and were discovered by Lewis and Clark in 1805. Mr. Catlin, who visited them not long before their extinction, describes them as very different from other Indians in appearance. He says: "There are a great many of these people whose complexions appear as light as half-breeds; and among the women particularly there are many whose skins are almost white, with the most pleasing symmetry and proportion of features; with hazel, with gray, and with blue eyes; with mildness and sweetness of expression and excessive modesty of demeanor, which render them exceedingly pleasing and beautiful. Why this diversity of complexion I cannot tell, nor can they themselves account for it; their traditions, so far as I have learned them, afford us no information of their having had any knowledge of white men before the visit of Lewis and Clark made to their village 38 years ago. Since that time there have been but very few visits from white men to this place, and surely not enough to have changed the complexions and customs of a nation."

MANDARA, an independent kingdom of central Africa, S. of Bornoo. It consists of a well watered valley surrounded by the Mendify mountains, some of whose summits rise to the height of 3,000 feet. The soil is fertile, and produces the *gobberah*, a species of fig tree remarkable for its great size, the ordinary circumference of the trunk being 86 feet. There is also a peculiar tree bearing a white and fragrant blossom resembling the seringa. Tamarind and mango trees are also common. Leopards and panthers abound in the woods, and the country is infested by scorpions, and by the *kiffu*, a peculiar species of venomous serpent. There are 8 towns in the valley, the chief of which is Mora, the capital. The people are Mohammedans, and are ruled by a sultan, whose body guard consists of 500 cavalry. They are negroes with well formed features, and are lively and intelligent. They cultivate cotton, and manufacture iron with considerable skill. The mountains around Mandara are inhabited by pagans, who hold the Mandaran sultan in great dread, and frequently send him tribute. The country was visited in 1828 by Major Denham; and in 1851 Dr. Barth accompanied a Bornoosee warlike expedition against Mandara, at whose approach the sultan submitted to the authority of the sultan of Bornoo.

MANDARIN (Port. *mandar*, to command), a term used by Europeans to designate Chinese and Cochinchinese government officers. It is much less employed than formerly, and the best recent writers on China do not use it at all, as the English word officer fully expresses its meaning.

MANDATE, a law term derived from the Roman civil law. It may be defined as a bailment (delivery) of a chattel or chattels to a person who is to do something with or about the things bailed, entirely without compensation. The essential element of the contract lies in the fact that there is not paid or promised, in law or in fact, any compensation whatever for the service to be rendered. The person delivering the chattels is called a mandator; and the person receiving them and undertaking the service is called a mandatary. As it must be a service or an act, the whole benefit of which rests with the mandator, this, by the ordinary principles of bailment, determines the amount of care to which the mandatary is bound, and the degree of negligence for which he is answerable. For negligence in a bailee has in law three degrees: slight negligence, which makes the bailee responsible where the bailment was wholly for his benefit; ordinary negligence, for which he is responsible if the bailment be for the benefit of both parties; and gross negligence, for which only the bailee is responsible where the contract is for the exclusive benefit of the bailor. And as it is not a mandate if the bailee derives any benefit whatever from the service, it follows that a mandatary is responsible for loss of or for injury to the thing delivered to him, only when it is caused by his gross negligence.—There is no especial form for the contract of mandate; it may be in writing or by word only, and made very solemnly or in the simplest way; in either case the law is the same. The mandator may recall the thing delivered at any time, and so rescind the contract. But if the nature of the contract be such, that a mandatary has rendered the service in part, and will himself suffer detriment if it be not completed, the mandator cannot now rescind it without providing adequate indemnity to the mandatary. When the contract is lawfully dissolved, the chattel must be restored to the mandator; but if indemnity be due to the mandatary, he would have a lien on the chattel to secure it. So too the contract would be dissolved by the death of the mandator or of the mandatary, or by any change in the state of the parties which from its nature should recall it; as by insolvency of either party, or insanity, or the marriage of a woman, or the sale of the property, or the termination of a guardianship on which the mandate rested. But in all these cases there must be the same exception as to a service partially rendered. So, too, it would seem that the mandatary may at his own pleasure terminate the contract; and as he may do this at any time, he may do it before he has begun to perform the service at all. But this very question has been more frequently and more elaborately discussed than any or all others which have arisen out of the contract of mandate. Chancellor Kent, in a case which came before the supreme court of New York when he was chief justice (4 Johns. 84), cited and considered an immense number of authorities bearing upon the law of mandate. And

yet the case itself was not a case of mandate, unless the definition above given, which rests on the authority of civilians and common law writers, be changed in an important respect. It was the case of a defendant who, being requested by the plaintiff to cause his vessel to be insured, promised to do this, and repeated the promise emphatically, and the plaintiff relying upon it effected no insurance. The vessel was lost, without insurance; and the defendant being called upon to respond for his negligence, the court treated the case as one of mandate. But here, nothing whatever was delivered to the defendant. He was not a bailee in any sense of the term. But the court applied to him the law of mandate, and held that he could not be made to answer for not doing the thing requested and promised, because, as he was to have no compensation, the promise was gratuitous, or without consideration, and therefore not binding. Many cases turn upon this question; and some uncertainty has been introduced by confounding the principles which should be applied to cases arising from contract, and those which belong rather to cases of wrong or trespass. We cannot doubt that the principles of law, applicable in either case, are quite clear. If a mandatary in the proper sense, that is, a bailee of some article with or about which he is to do something, receives it, and takes it away from the bailor and owner and into his own possession, here is a contract, and it is one which is founded upon a sufficient consideration. The mandatary promises to do a certain thing; and thereupon the mandator delivers to him certain property, and deprives himself of the power of getting the service rendered by some other person. The mandatary is therefore bound by his promise; and whether he performs it in part only, or neglects it altogether, he is liable; only, however, when his negligence be gross, and loss or injury spring from it, because the principle which runs through the whole law of bailment applies here also, and the consideration consists only of injury to the mandator and not of benefit to the mandatary; for a contract beneficial to one party only throws on the other no responsibility but for gross negligence. But if one who is in no sense a bailee, and therefore in no exact sense a mandatary, fails in performing a promise he has made without consideration, he is not answerable, on his promise, for any consequences. It is said, however, by some authorities, that if he begins his service, and leaves it half performed, he is liable on the promise. This we cannot admit. The law we believe is this: No man can be held in England or in the United States (except in Louisiana, where the common law does not prevail) for a breach of any promise, whether that breach be partial or total, if the promise rests upon no consideration. But if he who has made a promise, afterward does some injury to the promisee (and this would be the case if he does something which is positively injurious because it is not completed), he is liable for the injury

he has caused, as he would be if there were no promise between the parties.—Banks and bankers are so far mandataries, that they receive notes for collection, and render, or engage to render, by agreement or by mercantile usage, these and similar services without any especial or specific compensation. But it is understood that they do this as a part of their business, and for the general and indirect benefit they derive from doing it; and this is undoubtedly consideration enough to make them liable for any injury to their customer caused by their negligence; and it is sufficient to make them liable that their negligence was ordinary, or consisted in the want of common care. And a bank has, as bailee, a lien on its deposits for its general balance against the depositor.—We have seen that a mandatary is, by law, liable only for gross negligence. But it is a voluntary contract, and the parties may vary it in any way, and make it more or less stringent, at their pleasure. Where the parties enter into no specific stipulations, there the law sometimes varies their liabilities in accordance with the particular circumstances of the case. Thus, it is an obvious principle, that the mandator has no right to require any more skill or care than he has reason to expect. If an owner of a valuable chronometer carry it for repair to an ordinary watchmaker who does no business of this kind, and the instrument be injured in his hand because no more care and no better skill were applied to it than would suffice for ordinary watches, the owner has no one to blame but himself; unless he can show that the watchmaker especially undertook to be able to do the work required, and that the bailor had no means of knowing his incompetency. On the other hand, if the owner intrusted his instrument to a person who was known to deal with those of like kind, who professed this as his business, and expressly or by implication asserted himself to possess sufficient skill, this person would then be liable, as for gross negligence, if he did not possess the requisite skill, or did possess it but did not make use of it, although he was strictly a mandatary, and had undertaken the work gratuitously. Here, however, a distinction must be taken. If a workman who is paid for his service asserts himself to have sufficient skill, he is liable for injury resulting from the want of that skill, although he does his best. But if he is not paid for his service and makes the same assertion, he is now not liable merely for the want of it unless he made the assertion fraudulently and knowing its falsehood; but, however honest, he is liable if, beside a want of skill, he has been guilty of negligence.—Mandates in the civil law were the orders of the high functionaries, as the consuls and proconsuls, and afterward the emperors, to subordinate officers, to instruct them as to the conduct they should pursue, either in general or in particular cases.—At common law, the word mandate can hardly be said to be known. But it is sometimes used to signify an official command issued

by a court, or a magistrate, or any tribunal having authority, in the form of a writ or precept. It is generally, if not always, confined to commands issued to an inferior court, to confirm or set aside a judgment, as by the supreme court of the United States to a circuit court, or to a proper officer, to enforce or execute a judgment, decree, or order. When the command is issued to an individual who is a party before the tribunal, it is more commonly known as an injunction, prohibition, or the like.

MANDELAY, a new city, capital of the kingdom of Burmah, 8 m. from the Irrawaddy river and 600 m. above Rangoon; pop. in 1858 said to be about 800,000. In 1856 its site was occupied by cultivated fields; but after the royal determination to select a new capital, its erection was carried forward so rapidly that by July, 1857, it was ready for the reception of the court. It is defended by a wall of earth 16 feet high, which is to be strengthened by a facing of brick and a deep trench. The streets, which cross each other at right angles, are over 100 feet wide, and the principal thoroughfares are macadamized. Along their sides run narrow channels for carrying water through the city. In the centre a temporary palace was erected, and a new one, surrounded by a brick wall 6 feet thick, was among the earliest works undertaken. The houses are built with great uniformity, and are generally spacious. The city is laid out in the form of a square, the S. quarter being occupied by domesticated Chinese, and the W. by foreign residents. Outside of the walls several flourishing suburbs have sprung up, presenting ranges of well built teak and bamboo houses, and traversed by excellent public roads. Water is obtained from the river by a canal, which to obtain a proper level has to be carried a distance of 16 m.—Postal communication with Rangoon is kept up by dak boats, which leave Mandelay every 10 days, and make the voyage in 8 days. The king also owns 2 steamers which navigate the river when the depth of water is sufficient. Steam pumps have been set in operation to irrigate the adjacent fields, and every inducement is offered by the court to European mechanics and engineers to establish themselves in the new city.

MANDEVILLE, BERNARD DE, a Dutch physician and author, born in Dort about 1670, died in London, Jan. 21, 1738. He practised medicine without much success in London, and wrote "The Fable of the Bees, or Private Vices Public Benefits" (1728-'28), a philosophical satire on human nature, and other works.

MANDEVILLE, SIR JOHN, the earliest English prose writer, born in St. Albans about 1300, died in Liège, Nov. 17, 1372. He was a proficient in theology, natural philosophy, and medicine, and even practised as a physician for some time. In 1327 he proceeded to the East, and visited the holy places in Palestine, being favored by the sultan of Egypt, as also by the khan of Cathay, and travelled in Armenia, Persia, India, and Tartary. He returned to England in 1355,

and wrote a narrative of his travels and adventures, first in Latin, and afterward in French and in English, which he dedicated to Edward III. This work is a singular mixture of fact and fable, a monument at once of the author's candor and credulity. The earliest edition of it is that of Wynkin de Worde (Westminster, 1499), and the best edited by O. Halliwell (London, 1839).

MANDINGO, a country in W. Africa, bounded N. by Fouladoo, E. by Bambarra, S. by Gallonkadoo, and W. by Gadoo, lying between lat. 10° and 14° N., and long. 6° and 10° W. Much of this region is a high table-land, and contains the sources of the Senegal and the Niger. Iron is abundant in the mountains, and gold dust is found in the rivers. The country is divided into a number of small republics, each of which is nearly independent of the others. The most considerable of these states are Manding, Bambook, Bondoo, Dentilia, Saloom, Barra, Wooly, and Yarra. The capital is Kamalia.—The inhabitants, who are called Mandingos, are remarkable for their industry and energy. They are mostly zealous Mohammedans. The principal trade of that part of W. Africa which lies between the equator and the great desert is in their hands. They are not only active and shrewd merchants, but industrious agriculturists, and breeders of a good stock of cattle, sheep, and goats. They are black in color, tall and well shaped, with regular features and woolly hair. In character they are amiable and hospitable, imaginative, credulous, truthful, and fond of music, dancing, and poetry. They are adventurous travellers, extending their commercial journeys over the greater part of Africa. They trade chiefly in gold, ivory, and slaves. Polygamy is practised, and each wife has a separate hut. Their language is the richest of the negro tongues, is widely spread, and is written in Arabic characters. The Mandingos are the most numerous race of W. Africa, and have spread themselves to a great distance from their original seat, being found all over the valleys of the Gambia, Senegal, and Niger.

MANDOLINE, an Italian musical instrument now little used, resembling the old *mandola*, or small lute, of which name the word is the diminutive. It was furnished sometimes with catgut strings and sometimes with metallic ones, and was played by means of a quill or piece of wood.

MANDRAGORA. See **MANDRAKE**.

MANDRAKE (*mandragora officinarum*, Miller), a stemless plant, with lanceolate leaves, concealing beneath them several pale violet-colored flowers, and having a large, forked, fleshy, perennial root. It grows spontaneously in the south of Europe. The plant belongs to the natural order *solanaceæ*, which comprises many dangerous and deadly species. It was once called *atropa mandragora*, and it is considered more venomous and dangerous than the deadly nightshade or dwale (*atropa belladonna*). Its root, which is large, is often divided into 2 or 3 forks,

which have caused it to be likened to the shape of the human body, a circumstance attaching to it a reputation of being endowed with animal feelings; and there are fabulous stories of its uttering shrieks when torn from the earth. Sibthorp (*Flora Græca*, London, 1806-'40) says that the young Greeks wear small pieces of the root about them to serve as love charms; and among the ancients it was held in high repute for philters. The qualities of the mandrake are acro-narcotic, purgative, and aphrodisiac. According to Lindley, Dr. T. H. Silvester has shown that the root was formerly used in the same way as chloroform and other anæsthetic agents now are. The mandrake of the Old Testament (Gen. xxx. 14, 15, 16, and Canticles vii. 13) was thought, according to some commentators, to have the power of removing barrenness.—The American May apple (*podophyllum peltatum*, Linn.) is sometimes called mandrake, but is in no way related to the mandrake of the ancients. It is, however, a poisonous plant in its leaves and roots, the latter being a violent purgative, and resembling calomel in many of its effects.

MANDRILL. See **BABOON**.

MANES. See **MANICHÆANS**.

MANES, in Roman mythology, the souls of the departed, who were generally recognized as gods and propitiated by sacrifices at certain seasons called *feria dæmoniacæ*, and more particularly at an annual festival kept on Feb. 19 under the name of *ferialia* or *parentalia*, when each person made offerings to the souls of his deceased parents and benefactors. The manes were believed to have power on earth only by night.

MANETHO, an Egyptian historian, who flourished in the reign of Ptolemy Soter, at the beginning of the 3d century B. C. He was a priest of Sebennytus in Lower Egypt, and wrote in Greek a work on the religion and another on the history of his country, the title of the former being *Τὸν Φυσικὸν Ἑισαγωγὴν*, and of the latter *Ἀγνῶστικα*. Both books are lost, but numerous fragments have been preserved by Josephus, Julius Africanus, Eusebius, and by Syncellus, who compiled from the two latter. The list of the Egyptian dynasties, as preserved in the Armenian version of Eusebius, is the most valuable remnant of Manetho's history, the dates of which appear to have been derived from genuine documents, including the sacred books of the Egyptian priests. Attacked as a fabulist by various critics, Manetho has found zealous defenders among the most distinguished Egyptologists, and the recent discoveries in hieroglyphic archæology have served more to strengthen than to weaken his authority; but parts of the fragments are now generally acknowledged to be spurious, as is the astrological poem *Ἀπορρηστικὰ*, which bears his name, but is a work of late date.

MANFRED, prince of Tarentum, king of the Two Sicilies, natural son of the emperor Frederick II. and of Blanca, a daughter of Count Lancia of Lombardy, born in Sicily about 1231,

fell in the battle of Benevento, Feb. 26, 1266. At his father's death in 1250 he was appointed regent in Italy during the absence of his half brother, Conrad IV., the legitimate heir. Pope Innocent IV. immediately excommunicated him, declaring that the house of Swabia had ceased to rule over Sicily, because Frederic II. had died under the papal ban. Insurrections were excited in Capua, Naples, and other cities, but Manfred reduced most of the rebels, advanced to meet Conrad at Pescara, delivered the government into his hands, and aided him in completely suppressing the revolt. He was, however, removed from any part in the administration, his principality of Tarentum was taxed, and the Lanzias were exiled from it. Conrad died suddenly in 1254, leaving the crown to his infant son Conradin, and Manfred was again called to the regency. Innocent IV. renewed his opposition to him, supported by the Guelph party in the Two Sicilies, forced him to agree to hold his possessions as an immediate fief of the holy see, and had demanded from him an oath of entire submission, when he made his escape to the Saracens at Lucera. Aided by them, he defeated the papal troops at Foggia, recovered Apulia, and after the death of Innocent was recognized king of the Two Sicilies, and crowned at Palermo (Aug. 11, 1258), a report of Conradin's death in Germany being at that time spread through Italy. This report was immediately contradicted by envoys, but Manfred refused to resign the crown, and his bravery, handsome person, accomplishments, and success made the people willingly submit to his rule. Regarded as the hereditary protector of the Ghibellines, he sent troops to Tuscany, by whom the Guelphs were defeated at Montapertoso. His court abounded with poets and artists, and he himself was noted for poetic skill. He enjoyed a short release from the papal enmity under Alexander IV., but was excommunicated by Pope Urban IV., who offered his kingdom for sale to any European prince who had the strength to take it. Charles of Anjou, brother of Louis IX. of France, accepted the offer in 1264, was solemnly crowned by Pope Clement IV. at Rome in 1265, and marched thence for the conquest of the kingdom of the Two Sicilies. He was met by Manfred beneath the walls of Benevento. The latter was bravely supported by the Saracens, but the Apulians refused to advance against the enemy, the Sicilian army was thrown into disorder, and Manfred fell covered with wounds in the thickest of the battle. Dante alludes to his death and to his interment without religious rites (*Purgatorio*, canto iii.). He was twice married, first to Beatrice of Savoy, and next to Helena, a Greek princess, and left 3 sons and one daughter, who became the prisoners of the victor.

MANGANESE, a metal, the peroxide of which was known long since in the mineral used for decoloring glass, and now called pyrolusite; symbol Mn; chemical equivalent 27.5 (Von Hauer). The mineral was confounded

with the magnetic oxide of iron, and called *magnesia nigra*, until Pott in 1740 showed that it often contains only mere traces of iron. In 1774 Scheele and Bergman described it as a peculiar earth, and Gahn afterward obtained from it a new metal which he called magnesium. For this name, which was subsequently applied to the metallic base of magnesia, the terms manganese, manganium, and manganese have all been substituted, the last being now in common use. Manganese is not found native, but is reduced from its oxides by subjecting these in a finely pulverized state and mixed into a paste with oil at an intense heat in a close crucible; the button of metal obtained by this method soon tarnishes on exposure, absorbs oxygen, and falls to a brown powder. It decomposes water, and to be kept must be in a hermetically sealed tube, or in naphtha. The metal is hard and brittle, resembling cast iron in its color and granular texture; but it is exceedingly difficult of fusion, and when pure is not magnetic. Its specific gravity is variously given from 6.85 to 8.018. It accompanies iron; and the ores of one of these metals almost invariably present traces or larger quantities of the other. There are various points of resemblance between the 4 metals, manganese, iron, nickel, and cobalt, and their modes of occurrence. Their equivalents also succeed each other in the following order: 27.5, 28, 29, 30, those of the last two being thus determined by late researches of Schneider. (See NICKEL).—A communication was made in 1857 by M. Brunner to the French academy of sciences, setting forth some new features in the qualities of manganese as prepared by his method, which was to treat the ores as the oxides of aluminum are treated in obtaining that metal. A crucible is charged with alternate thin layers of fluor spar, carbonate of soda, and manganese ore; twice as much fluor spar as soda being used. The mixture is covered with a quantity of dry common salt, and this with coarse fluor spar, which serves to keep the rest in the crucible during the violent action which ensues. The crucible, being covered, is exposed to a low heat, which is gradually increased to a bright red. A hissing noise is heard, and a yellow flame is seen issuing from the crucible. In a quarter of an hour the furnace may be closed for the fire to go down, and when the crucible is taken out and broken, a button of manganese is obtained from the bottom. If thorough fusion has not taken place, the contents of the crucible should be broken up in a steel mortar and again fused with dry common salt, or dry potash with a tenth part of nitrate of potash. Borax is not a good flux, as it injuriously affects the quality of the metal. The manganese thus obtained has a color like that of cast iron; it is very brittle, being easily crushed into fragments, and so hard that it resists the hardest steel instrument. It takes a most beautiful polish, which is not affected by exposure for months to the vapors of a laboratory. When heated on a sheet of platinum it undergoes changes of color like those of

steel similarly treated, and finally becomes brown from the coating of oxide which forms upon it. The specific gravity of the metal is from 7.188 to 7.206. It is not attracted by the magnet. It is dissolved in nitric, sulphuric, hydrochloric, or acetic acid. The hardness of the metal renders it suitable for various mechanical purposes. An angular piece of it may advantageously be used instead of a diamond to cut glass, and even to work steel and other metals. The polish which it is capable of taking renders it applicable for the mirrors of optical instruments. Although it cannot be wrought, it may be cast into moulds as easily as iron. It may be used by engravers and steel manufacturers, and will probably be made available for many other purposes in the arts and sciences, either alone or alloyed with other metals.—The compounds of manganese and oxygen are 7 in number, 2 of which are intermediate or compound oxides. They are: protoxide or manganoous oxide, MnO ; sesquioxide or manganic oxide, Mn_2O_3 ; bioxide or peroxide, MnO_2 ; manganoso-manganic oxide or red oxide, Mn_3O_4 , or $MnO + Mn_2O_3$; varvicite, Mn_4O_7 , or $Mn_2O_3 + 2MnO_2$; manganic acid, MnO_3 ; and permanganic acid, Mn_2O_7 . The first is the base of the ordinary salts of manganese, and is interesting for its frequent occurrence in mineral compounds, and the isomorphism of its salts with those of magnesia and others of its class, which it frequently replaces. The red oxide, so called from its brownish red appearance when in fine powder and cold, is produced by calcination of the higher oxides. When warm its powder is nearly black. It is this oxide in very small quantity that gives the characteristic tinge to the amethyst, and colors various minerals and artificial glassy compounds an amethyst or violet color. Manganic acid is produced when compounds of manganese are fused with potash or carbonate of soda, and combining with the alkali a green-colored compound is obtained. This is a common blowpipe test of the presence of manganese. The compound of chief interest among those named is the bioxide, or as it is commonly known the peroxide or black oxide of manganese. It occurs in nature in the form of the earthy mineral wad, which consists of 2 equivalents of peroxide combined with one of water; and also in the one called pyrolusite (Gr. *ρυπ*, fire, and *λυω*, to solve, in reference to its action in destroying the green and brown tints in glass). The latter is largely employed in the arts in the preparation of oxygen, the stone of the purest quality giving up of the gas about $\frac{1}{4}$ of its weight when brought to a white heat. By means of this chlorine is evolved from its natural compounds, and oxide of manganese is thus an important element in the manufacture of artificial compounds of this element. (See BLEACHING POWDER, and CHLORINE.) Its power of decoloring glass tinged by green protoxide of iron, Liebig suggests, is not due to its converting this into the faint yellow sesquioxide, as has been supposed, but to its producing

an independent amethystine tint, which neutralizes the optical effect of the green stain of the iron. Peroxide of manganese is also employed to give a dark-colored glaze to pottery; and by Berzelius it was recommended for preserving water sweet on long voyages, a few pounds being introduced into each cask. The black oxide of manganese, when slowly introduced into the system, as happens to those grinding the ore, is said to act as a cumulative poison, its effects first appearing in a staggering gait and symptoms of palsy. As a medicine the oxide is sometimes administered in cases of diseases of the skin, of scurvy, &c. By means of its salts of the protoxide are prepared, which are employed like those of iron for their tonic and anti-anæmic properties, and unlike these can be used in conjunction with tannic acid and other astringent medicines.—Though manganese is present at least as a trace in almost all minerals and rocks, its oxide is not often found so free from impurities, and especially from oxide of iron, as the ore is required to be for commercial purposes. Mines of it have been wrought to considerable extent along the range of the hematite ores in Vermont and Massachusetts, as at Chittenden, Bennington, West Stockbridge, and Sheffield; and in the southern states it is known to occur at many localities along the range of the metamorphic rocks. It is found like the hematites in loose masses of clays and sands which are associated with the limestones of this group. The pyrolusite, more or less mixed with iron ores, runs up into the crevices of the limestone, and is distributed in very uncertain quantities. The finest ores are foreign, and are imported to considerable extent into the United States from France, Germany, England, and Nova Scotia. Some of the most extensive mines in Europe are in Thuringia and Moravia. In England the consumption of oxide of manganese is about 25,000 tons annually, and of this 17,000 to 18,000 tons are employed in the manufacture of bleaching powder.

MANGEL WURZEL. See BEET.

MANGLES, JAMES, a British naval officer and traveller, born about 1785. He entered the navy as a volunteer in March, 1800, and in 1801 he was appointed midshipman on board the *Narcissus*, and soon after took part in the expedition to the Cape of Good Hope. After the capture of the French frigate *Volontaire* in 1806 he was made acting lieutenant. In 1814 he was appointed to the *Duncan* as first lieutenant, and in the following year promoted to the rank of commander. In 1816, in company with Capt. O. L. Irby, he visited the continent and various parts of the Levant, went up the Nile with Beechey and Belzoni, and joined Belzoni in clearing away the sand from the entrance to the great temple of Abousambul. They then crossed the desert to Syria and the Dead sea, whence in 1820 they returned to England. Soon afterward they printed for private circulation a selection from the letters written by them while absent to their friends at home, and in 1844

Mr. Murray, having received from the authors a gift of the copyright, republished the work in the "Home and Colonial Library," under the title of "Travels in Egypt and Nubia, Syria, and the Holy Land." It is written in a simple, unostentatious style, but is very interesting and trustworthy. Capt. Mangles retired from the navy on half pay in 1882.

MANGO, the name of a delicious East India fruit, produced by a tall tree with a spreading top, which, when not in flower, resembles the sweet chestnut; it is the *mangifera Indica*, and belongs to the natural order *terebinthaceae*. The foliage of the mango consists of oblong lanceolate, petiolate leaves; the flowers are polygamous and borne on erect terminal panicles; they have white petals streaked with yellow and spreading at the apex; only a single stamen of the many in each blossom is fertile. The fruit is a somewhat kidney-shaped, smooth drupe or plum, which when fully ripe is yellow and reddish, or speckled with black, replete with a fine agreeable juice; some are full of fibres, and the juice runs out of these on cutting or with a little handling; but those which have few or no fibres are much the finest; they cut like an apple, but are more juicy, and are said to be sometimes as large as a man's fist, but the most common are about the size and appearance of a small golden-pippin apple. The mango is esteemed to be very wholesome, and, with the exception of the mangosteen and some of the best pineapples, it is considered the finest tropical fruit. In India, preserves, tarts, and similar confections are made from the unripe fruits; pickles are also made from the green fruit and sent to Europe. There are numerous varieties of the mango, chiefly differing in the size, color, flavor, and figure of the fruit, like apples and pears. The best mangoes have an agreeable acidity, and a rich, sweet, perfumed flavor. Belonging to a natural family which secretes a gummy resin, it is not singular that the wild fruits of the mango contain often a strong terebinthine flavor, which renders them not very palatable; hence much discrepancy exists as to the value of the fruit. But when due care is taken to procure the best sorts, by raising them from layers of well known and esteemed varieties, there is no dispute about their merits. In Cuba, where it has been introduced within perhaps a century or little more, there are already numerous varieties, well known by distinct names. One of these is called the heart mango, and is among the largest and best, being more delicate and having less of the turpentine flavor. The mango tree is described as being one of the most beautiful of the fruit trees upon the island, its leaves long, lanceolate, polished, hanging in dense masses of dark green foliage. The mango is well adapted to hothouse culture, on account of its bearing fruit when small. Sweet informs us that in England the fruit ripens under such culture. Its favorite soil seems to be a sandy loam or a mixture of loam and peat made up into beds

well drained. Fresh seeds from the West Indies vegetate freely, but cuttings from well known kinds are preferable; such can be rooted in sand under hand glasses. The mango is cultivated in bark beds of hothouses in various parts of the United States.

MANGOSTEEN (Malay, *mangostana*; *Garcinia mangostana*, Linn.), a tree growing with an upright stem to the height of 20 feet, and bearing a very beautiful and eatable berry, esteemed the most delicious of East Indian fruits. The mangosteen belongs to the natural order of *guttiferae*, which contains trees that are natives of the hottest parts of the world, and well known by their thick, entire, opposite leaves and resinous juices. In countries where they grow, they are of great importance; and of this character may be considered the mangosteen. Its leaves are entire, about 7 or 8 inches long, and about half as much in breadth at the middle, gradually tapering at both ends, of a shining green above, but of an olive color beneath. The flower resembles a single rose, composed of 4 roundish petals, which are thick at the base, but thinner toward the margins; they are of a dark red color. The fruit is round, about the size of a middling orange, and is crowned by a broad peltate-lobed stigma; the rind is like that of the pomegranate, but softer, thicker, and faller of juice; it is green at first, but changes to a dark brown with some yellowish spots; the inside is of a rose color, and is divided into several cells by thin partitions, in which the seeds are lodged, surrounded by a soft, juicy pulp of a delicious flavor partaking of the strawberry and the grape. It can be eaten in great quantities without any inconvenience, and it is the only fruit which sick people in India are allowed to eat without scruple. It is said that Solander, when in the last stage of a putrid fever at Batavia, found himself insensibly recovering by sucking this delicious and refreshing fruit. The pulp has a most happy mixture of the tart and the sweet, and is no less salutary than pleasant. The dried bark of the *Garcinia* is used with success in dysentery and tenesmus, and an infusion of it is considered a good gargle for a sore mouth or for ulcers in the throat. The several species of the genus are recommended for their beauty as fitted for stove plants, and are readily raised from cuttings under hand glasses. They all require a high temperature in order to thrive.

MANGOSTE. See **ICHNEUMON**.

MANGROVE, the popular name of a variety of tropical plants constituting the natural order *rhizophoraceae*. They grow on the shores of rivers, and extend down to the verge of the ocean, rooting in the mud and forming close thickets and even forests, reaching sometimes below high water mark, so that the branches are loaded with oysters and other shell fish. Such a dense mass of vegetation effectually excludes the sun's rays, and prevents the exhalation of the putrefying and miasmatic gases, thus rendering the vicinity unhealthy and dangerous. The mangroves are exogenous shrubs or trees,

having simple, opposite, occasionally dotted, entire or else serrate leaves, with convolute deciduous stipules between the petioles. Their flowers are polypetalous, each petal arising from the calyx and alternating with its lobes, and of the same number; the stamens are of an indefinite number, 2 or 8 times as many as the petals, having distinct filaments, and erect, innate anthers. The ovary is plurilocular, its cell containing 2 or more ovules. The fruit is indehiscent, crowned with the calyx, one-celled and one-seeded. In natural characters, it will be seen, the mangroves are structurally allied to the myrtles; there is a marked peculiarity, however, in the germination of the seed. There are several distinct genera embraced in the natural order of the *rhizophoraceae*, but the number of mangroves proper seems to be few. Of these may be instanced the common or black mangrove (*rhizophora mangle*, Linn.), found in the Caribbean islands, and stated likewise to be native to Malabar. These trees vary in height, being in some places 20, in others above 80 feet high, in proportion to the richness or depth of the muddy soil in which they grow. The bark is smooth, of a light brown, in the smaller branches inclining to red; the leaves are somewhat like those of the bay, with their middle veins yellow, having footstalks an inch long; the smaller branches are jointed at the distance of every inch. The flowers usually grow 2 or 3 together, and sometimes on single footstalks 2 or 3 inches long, having each 4 yellow petals, which before they open are covered with a greenish calyx divided into 4 parts; the flower is succeeded by green succulent substances in form not unlike a pear, at the small end of which hangs a single seed about 6 inches in length. These seeds when they fall are carried floating on the water and lodged on muddy banks, where their larger ends settle in the mud and take root, the smaller ends sprouting into branches and leaves. The trunk of the mangrove seldom grows to any considerable thickness, but the wood is tough and hard, bears the water well, and is much used for knees and ribs in long boats and other small craft, for which the archings and angles of its limbs most naturally adapt it. Its lower branches become frequently the supporters of the oyster, which has given rise to a fabulous account of the growth of this shell fish. The fruit of this species is said to be sweet and edible, and its juice fermented makes a light wine. Branches, limbs, and trunks of these trees are brought from Cayenne as ballast or for dunnage and sold as fuel, for which use they are excellent. There are two varieties known there, that called the red being the best and hardest wood; of the other, called the white, the wood is light, poor, and worthless as fuel. The mangrove of the East Indies, also occurring in the West Indies, is the *R. candel* of Linnaeus. Its branches bend downward, but do not take root in the ground. Its wood is heavy, of a deep red, and takes a very fine polish.

MANGUM, WILLIE PERSON, an American statesman, born in Orange co., N. C., in 1793. He was graduated at the university of North Carolina in 1815, subsequently studied law, and in 1818 was elected a member of the house of commons from Orange co. In the succeeding year he was elected a judge of the superior court, and between 1823 and 1826 represented his district in congress. In the latter year he was again elevated to the bench, and in 1831 he was elected a senator in congress, where he served a full term. In 1837 he received the 11 electoral votes of South Carolina for president of the United States. For 12 years subsequent to 1841 he was a senator in congress, and during the administration of President Tyler was president of the senate. Since 1853 he has lived in retirement. During the greater part of his congressional career he was a leading member of the whig party.

MANICHEANS, or MANI, a religious sect, founded in Persia in the 2d half of the 8d century A. D. by Manes or Mani. The life of the founder and the origin of the sect are still involved in great obscurity, as there are two varying accounts of them, the one found in Greek, the other in oriental writers. The Greek account refers back to the record of a disputation between Manes and Arohelaus, bishop of Cascar in Mesopotamia, which is said to have been first written in Syriac, and soon translated into Greek, but the greater part of which now exists only in a very corrupt Latin translation. According to this authority, Manes was not the real author of the system which is called after him, but he fraudulently appropriated the writings of two predecessors, Scythianus and Terebinthus, and proclaimed their doctrines as his own. The first came forward as the teacher of a new religion in the capital of Persia, whence he sent one of his disciples, Thomas, to Egypt, another, Addas, to Scythia, while only Hermas remained with him. He promised to the king to cure his sick son; but the latter died, and Manes was imprisoned. There he was found by his disciples on their return, who told him of the opposition their doctrines had met with among the Christians. Manes then procured a copy of the Christian Scriptures, adopted some portions, changed others, and referred to himself the promise of the Paraclete. When his disciples were sent out by him a second time, the king intended to have him put to death, but he escaped. He was invited by the bishop of Cascar to a public disputation, and, according to the bishop's report, was completely refuted. Fleeing from the rage of the people, he fell into the hands of the king of Persia, who now had him put to death, his skin stuffed, and his flesh given to the birds. This Greek account is not regarded by historians as very authentic, but the opinion of Beausobre and Neander that the whole of it should be rejected is not generally adopted.—The oriental accounts of Manes are not so old, but clearer and more trustworthy. In some points

they differ among themselves, especially with regard to the relation of Manes to Christianity. Abulfaragius states that Manes was a Christian presbyter, who apostatized, called himself the Messiah, and sent out his disciples to preach his dualistic system throughout the countries of the East as far as Hindostan and China. The Mohammedan writers, on the other hand, say nothing of his having been a Christian. But, in general, Manes appears in the oriental works as a celebrated Persian magian, astronomer, and painter, who aimed to introduce a perfect universal religion. At first he was a favorite of King Sapor, but subsequently had to flee to India, where he became acquainted with Buddhism, some of whose doctrines he received into his system. He was protected by King Hormas, and returned to Persia in 272; but the next king, Bahram, ordered him to be put to death about 277, when he was accused by the magi of corrupting the old religion. The report that he was flayed alive is not mentioned in the best authors, and seems to be a later invention.—After the death of Manes his adherents in Persia were subjected to a long persecution, and many of them are said to have fled to Hindostan. Sapor II. condemned all the members of the sect to death on account of their doctrine of celibacy, but they continued to be numerous, and found converts even at the court and in the royal family, thereby occasioning a new persecution in 525. Some congregations of Manichæans are mentioned in the 8th century. They split into several parties, of which little more is known than the names. In Syria, Egypt, Palestine, and other countries, the Manichæans early made their appearance, and the northern coast of Africa became one of their principal seats. An edict of Diocletian, about 290, the genuineness of which is still doubtful, ordered the proconsul of Africa to burn the leaders of the sect, together with their writings. Under Constantine the Manichæans were included in the general toleration, but the succeeding Christian emperors issued severe decrees against them, especially after 372. Nevertheless they continued to prosper for a long time. Their congregations were numerous, and had many able leaders, as Ælimantus, Faustus of Miletus, Felix, and others. Augustine was for 9 years a member of this sect, but left them when he found among them neither the thoroughness of learning nor the purity of character which he had expected. He became their most zealous opponent, yet did not succeed in converting many. The Arian Vandals persecuted the Manichæans most cruelly. In Italy, and especially in Rome, they were very numerous, and maintained intimate relations with the congregations in other countries. Pope Leo I., in union with the secular government, took severe measures against them, by which the various ramifications of the sect were discovered. Valentinian III. punished them with exile, and Justinian ordered all Manichæans to be put to death. By these persecutions the sect gradually became extinct, al-

though traces of it are found, in later centuries, in Gaul and Spain, and its influence extended throughout the middle ages, reappearing under different modifications, in the Priscillianists, Paulicians, Bogomiles, Catharists, and other sects, who were therefore called New Manichæans.—Of the writings of Manes only a few fragments are left (Fabricius-Harless, *Bibliotheca Græca*, vol. viii. p. 315 *et seq.*), especially from his *Epistola Fundamenti* and the *Theaurus*. But these fragments, as well as what is left of the writings of other Manichæans, have been preserved in the writings of their opponents. The latter are numerous, and Augustine in particular published a number of volumes against them. The detached portions of the Manichæan system, contained in the ancient writers, were collated with great skill by Dr. C. F. Baur of Tübingen, *Das Manichäische Religionsystem nach den Quellen untersucht* (Tübingen, 1831), which is generally acknowledged as the standard work on the subject.—Manichæism, like the kindred Gnostic systems, is an attempt to blend portions of Christianity with the dualism of Persia and the pantheism of Indian Buddhism into a higher form of universal religion. Dualism, however, is the basis. Manes assumes two original substances, in which all opposites concentrate, and from which they proceed. "There were," as he says in his book of mysteries, "God and Hyle, light and darkness, good and evil, absolutely opposed to each other so as to exclude any communication." Thus matter, which in the Zoroastrian doctrine is by no means regarded as bad in itself and as anti-divine, is identified with the bad and with darkness, and opposed to good, which is the essence of light. The latter is represented as the pure, intelligible light, and the visible light is said to be its work and image. God is the father of light, and is described as being all splendor, truth, holiness, goodness, and happiness, dwelling amid innumerable beings of light, and surrounded by 12 aeons or worlds of light, which as a heavenly zodiac preside over the great year of the world. They are not, however, emanations from God, but God is one with the kingdom of light, the whole forming one substance. Opposed to the kingdom of light is the kingdom of darkness, which is divided into 5 regions, and in which the demon or prince of darkness sustains the same relation to his superiors as the God of light occupies in his kingdom. By an inroad which the kingdom of darkness made into the kingdom of light, the primitive man, who was the first born son of God, was overthrown and imprisoned. He was subsequently delivered, but a portion of light remained imprisoned in the darkness. God then brought into existence, through the agency of the mother of life, the present universe, that it might be a new receptacle of this lost light. Two new heavenly powers, Christ and the Holy Ghost, proceeded from God, to redeem the retained light from its imprisonment. While they attract the forces of light from the material world, the prince of

darkness and the spirits imprisoned in the stars seek to keep them back. He therefore formed the man Adam after the image of the primitive man, combining in him as in a microcosm the clearest light with his own darkness. From him descended the human race, each individual of which presents a mixture of the two elements, light and darkness. As generation is a principle belonging to the kingdom of darkness, every new generation weakens the power of the light and fortifies the ascendancy of matter. In Judaism and paganism mankind fell entirely under the dominion of matter. To break this dominion Christ appeared, in order to reveal again the lost truth. He showed himself on several occasions in his true form of light, especially on the mountain of transfiguration; but the pure light of his essential being could not unite itself with matter. Therefore his life upon earth, his sufferings and death, were merely a semblance. He was neither born of a woman, nor baptized, nor did he die nor rise again. The statements of the New Testament are only partially true; the full truth about Jesus was first revealed by the Paraclete (Manes). The genuineness of the Gospels and of the Acts was denied by the Manichæans; the Epistles were regarded as interpolated, and many apocryphal Christian writings, especially the Acts of Thomas, were made use of by them. Christ by his doctrine and his attractive power commenced the process of liberating the light from its bondage, but the carnal minds of his contemporaries generally misunderstood him, and it required the coming of Manes to reveal the secret relations of the universe, and to secure the means of human freedom. Manes, as the Paraclete promised by Christ, led men to a knowledge of the complete truth. The redemption of man consists in a knowledge of the revelations made by Christ and Manes respecting the character of the two empires, the soul and its relation to the body, and a corresponding mode of life. Thus their system of ethics was severely ascetic, based on the conviction of the intrinsic evil of the body. Their great aim was to set the soul or the imprisoned light free from the fetters of matter. The abstinence which they therefore observed was of a threefold character: 1. The *signaculum oris* forbade all impure thoughts, bad and blasphemous words, but above all the eating of any kind of food which might increase the power of the body over the spirit, and especially of flesh, which, as the product of Hyle and in consequence of the death of the animal, entirely destitute of light, can only depress the soul. Wine and strong drink in general were prohibited. 2. The *signaculum manuum* prohibited every kind of work through which man cultivates this world, which is the kingdom of Satan, or makes it a pleasant home. The killing of animals, gathering of fruit, &c., were regarded as an offence against the light of life diffused through all nature. 3. The *signaculum sinus* rejected all sexual delight as coming from the Hyle, continuing the first sin, and preparing

by procreation new prisons for the soul. Legal, external marriage was not absolutely forbidden, but celibacy was strongly recommended, while the prevention of procreation was a moral duty. This rigorous asceticism was, however, not prescribed for all, but only for the higher class of members, who were called *electi* or *perfecti*, and whose relation to the lower class or *auditores* corresponded to that of the faithful and the catechumens in the Catholic church, or that of the pneumatics and psychics among the Gnostics. The auditors were permitted to eat meat, to marry, to occupy themselves with material and industrial pursuits, and to fill public offices, but were also bound to supply the elect with all the necessities of life. For the destruction of plants and several other sins which the auditors could not avoid, they received, through the intercession of the elect, absolution and indulgence. (See Wegner, *Manichæorum Indulgentia cum brevi totius Manichæismi Adumbratione*, Leipsic, 1817.) With the death of the elect, a new process of purification begins. A large wheel with 12 buckets, which is fastened on the heavens, receives their souls and conveys them to the moon. The full moon represents a ship laden with light; after 15 days it is emptied of its cargo, which is conveyed over to the larger light ship, the sun. The latter conveys the purified souls into the kingdom of light. The auditors reach their aim only by long and circuitous paths. The fate of unbelievers is everlasting damnation.—Only the elect constituted the church. Among them there were a number of offices, probably formed after the hierarchy of the Catholic church. Manes himself had sent out 12 apostles, and this college was afterward represented by 12 *magistri*, with a 13th invisible one, without doubt Manes himself, at their head. After them followed 70 or 72 bishops, who in turn had under them presbyters, deacons, and the other *electi*. Their worship consisted mostly in hymns and prayers, and while offering these they used to turn toward the east. They had no temples. Sunday was celebrated as the day of the sun, but, contrary to the custom of the Catholic church, with fasting. Baptism with water was not used. The ceremonies at the reception of new members and their mode of celebrating the eucharist are not well known. They commemorated the death of Christ, but with still greater solemnity that of Manes. The latter festival was called the festival of the pulpit (*bema*). A pulpit was erected in the hall and hung with costly draperies; 5 steps led to it, perhaps symbolizing the 5 orders of the hierarchy; and the believers prostrated themselves before it.—See, beside the works already mentioned, Beausobre, *Histoire de Manichée et du Manichéisme* (2 vols. 4to., Amsterdam, 1789-'44).

MANIGAULT, GABRIEL, an American merchant and revolutionary patriot, born in South Carolina in 1704, died in 1781. He was the son of Huguenot parents who emigrated from France to avoid religious persecution; and

about the age of 25 he embarked in business in Charleston, of which he became one of the wealthiest and most esteemed citizens. Sympathizing with the patriotic cause in the revolutionary war, he advanced to his native state out of his private fortune the sum of \$220,000; and when the city of Charleston was menaced by the British under Gen. Prevost, he armed himself in its defence, although he was then 75 years of age, and caused his grandson, a boy of 15, to be likewise armed and equipped. He was distinguished for his integrity and benevolence, and was a zealous supporter of the French Calvinist church in Charleston.

MANILA, the capital of all the Asiatic possessions of Spain, comprising the Philippine, Ladrones, and Caroline archipelagoes, situated in the island of Luzon, at the mouth of the river Pasig, which discharges into the bay of Manila, in lat. $14^{\circ} 36'$ N. and long. $120^{\circ} 52'$ E.; pop. about 160,000, of whom about 8,000 are Europeans and 7,000 Chinese. The great bulk of the inhabitants belong to the Pagalas and other races of the Philippine archipelago. A portion of the city, situated on the S. or left bank of the Pasig, is enclosed by walls and moats; and this fortified part contains the cathedral, palace of the governor-general, court of justice, military barracks, arsenal, town hall, and other public buildings. It has about 18,000 inhabitants, a large proportion of whom are Europeans. On the N. bank of the Pasig are the suburbs, which contain all the warehouses, shops, manufactories, and abodes of the native population. The walled city and suburbs are connected by a handsome stone bridge of 10 arches. The environs of the fortified portion are beautified by a tastefully laid out *paseo*, or promenade, shaded by avenues of luxuriant tropical trees. There is also a spacious cemetery, filled with rich monuments, and with evergreen shrubbery. The churches, convents, and monasteries are very numerous. The chief industry of the native population is connected with the preparation of tobacco, hemp, and pina fibre, a beautiful fabric made from the pineapple leaf, for home markets and exportation. The cigar manufacture employs 7,000 women and over 1,000 men; and the fine species of grass matting prepared here is much used in the manufacture of hats and baskets. A larger remuneration is given for native labor than in any other city of the eastern hemisphere. An ordinary laborer receives \$8 to \$10 per month, which is double what he receives in Calcutta and Batavia; and yet subsistence can be procured as cheap in Manila as in any part of India or the Malay archipelago. This city is by law the sole emporium of foreign trade with the Spanish East Indies. Its site is happily chosen, within a spacious bay, with good anchorage, and situate upon a short navigable river, with rapid current, communicating with the Lado de Bay, the largest body of fresh water in the Asiatic archipelago, which furnishes the city with an abundant supply of excellent fish. The

value of land in the vicinity of the city is very high. According to statements in the *Estado de las Filipinas*, the price of a *quithon* of land (a measure of 1,000 square fathoms) is from \$800 to \$1,000, or about \$600 per acre. The climate is healthy, but the city is subject to severe rain storms and hurricanes; the latter are most violent at the change of the monsoons, and have often torn vessels from their anchorage, and carried them far inland. The wet monsoon continues about 5 months; and during this period as much as 115 inches of rain has fallen at Manila, and the lowest quantity was 84 inches. The temperature is very equable; the thermometer seldom rises above 97° F. or falls below 75° .—In 1569 the site of Manila was occupied by a small Malay town, defended by stockades, which was captured and destroyed by 80 Spaniards under the command of Juan de Salcedo, nephew of Miguel Lopez de Legaspi, the conqueror of the Philippines and founder of the city of Manila. Legaspi was indefatigable in promoting the growth of this city. Within two years after its conquest he had built the great cathedral, the metropolitan church of all Catholic Oceanica. He established a municipal organization, which was confirmed by Philip II. of Spain, and continues to be its form of city government. Chinese laborers and traders settled in large numbers in the city, and in time became very turbulent. In 1603 an insurrection took place, and 23,000 Chinese were massacred. Notwithstanding this, in 86 years after this event the Chinese numbered in Manila about 80,000. The severity of imposts and religious persecution again led to insurrection, which terminated with the slaughter of about 25,000 Chinese, and the banishment of the remainder; but they soon again resorted to the city in large numbers, and assisted Sir William Draper in the capture of it in 1762. The English expedition, composed of 2,800 Europeans and sepoys, which sailed from Madras, took the city by storm, after a siege of 10 days. The governor and archbishop agreed to pay \$4,000,000 on condition that the sack should last only 8 hours; one fourth of the amount was paid on the spot, and the balance of the demand was met by a draft on the royal treasury of Madrid, which however was dishonored. The English commander has been rendered conspicuous by his controversy with Junius concerning this ransom. The Japanese had much trade with this city, and were settled in it in large numbers during a portion of the 17th century, before their laws excluded them from all communication with the rest of the world. They imported the raw material extensively used in their manufactures directly from the Philippine, as also from the Malay archipelago. The recent opening of Japan to the trade with foreign nations will probably revive the former commercial relations between that country and Manila. Manila maintains active commercial relations with France, Germany, Switzerland, China, California, the Sandwich

islands, and Ohili, but chiefly with Great Britain and the United States. The imports consist of cotton, woollen, and silk manufactures, watches, clocks, jewelry, and drugs. The principal exports are tobacco, indigo, hides, sapan wood, sugar, and hemp, and cigars and cheroots. The export of cigars to the United States from Manila in 1857 was nearly 5,000,000, and of the whole Philippine islands in 1859, 11,000,000.

MANILIUS, MARCUS, the author of an astrological Latin poem entitled *Astronomica*, whose history is altogether conjectural. Bentley supposed that he was an Asiatic, and Huet that he was a Carthaginian, and there are indications in his poem that it was written under Augustus, or at furthest not later than the reign of Tiberius. It is in 5 books, in a rough and unfinished state, showing perhaps that it was never published in the author's lifetime. It treats successively of the origin of the universe, the rise and progress of astronomy, the position and magnitude of the earth, the signs of the zodiac, the constellations, planets, comets, and meteors. It then discourses of the universal and almighty soul pervading every part of the universe, vindicates the dignity of astronomy, and finally enters into the details and technicalities of the science. Whewell says that it has no value in the history of science. The first manuscript of the *Astronomica* was discovered by Poggio in 1416, and was printed at Nuremberg in 1472 or 1473. Other and better MSS. were afterward found, from which were prepared the editions of Scaliger (Leyden, 1600) and Bentley (London, 1730). There is an English metrical translation of the poem by Creech (London, 1697).

MANIN, DANIELE, an Italian statesman, born in Venice in 1804, died in Paris, Sept. 22, 1857. The son of an eminent lawyer, he prepared himself for the same profession at the university of Padua, where he was graduated in 1821. He married in 1825, and led a quiet domestic life at Mestre, near Venice, engaged in historical and legal studies and writings; and commencing practice at the bar about 1830, he gained a high reputation as a jurist and orator. He early became known as a champion of the national party, though not involved in any of the secret societies, and aiming to combat Austria rather with legal weapons than by conspiracies. On several important political trials, however, he acted as counsel for the defence, which brought him into collision with the government. After the accession of Pius IX. to the holy see, Manin and Tommaseo became the leaders of the reform movement in Venice (1847). Manin exerted himself to make Austria give practical effect to the laws which she had nominally granted to Venice. He asked for a separate government of Venice and Lombardy, a revision of the codes, an annual budget, and freedom of religion and of the press. But his hopes of gaining pacific concessions from the house of Hapsburg were destroyed by Radetzky's massacres in Milan (Jan. 9, 1848), his and his colleague's protests (Jan. 18) against the gener-

al's proceedings resulting only in the imprisonment of the two patriots. The French revolution of Feb. 24, 1848, found him still in prison; and as he was detained illegally he refused to be set free by the populace (March 17), and would only leave his place of detention on a decision of the courts. The revolution advanced in the mean time with rapid strides; the Austrian commander, Count Zichy, was obliged to surrender, March 22; the republic of Venice or St. Mark was proclaimed, March 23, and Manin and Tommaseo were placed at the head of affairs. The Venetians prepared to form an independent republic in confederation with the other Italian states; but as the policy of Charles Albert seemed for a while auspicious for the liberation of the whole country, the Venetian assembly, which was convened June 8, agreed to the fusion with Piedmont and Lombardy so as to form a united kingdom of northern Italy. Manin tendered his resignation on the occasion, but resumed power after the defeat of the Sardinians at Custoza (July 25), when Lombardy was restored to Austria, and when the Venetians fell back upon their own resources and prepared for a separate defence. The republican banner of St. Mark was again hoisted, Aug. 11, and a triumvirate was appointed to carry on a dictatorial government, Aug. 18, Manin being its head, while the military command was intrusted to the Neapolitan general Pepe. After some time the dictatorship was succeeded by a responsible administration, but Manin continued to hold supreme power as its president, maintaining order in Venice, and organized the resistance against the Austrians, who blockaded the city. After the destruction of the hopes of Italy by the defeat of Charles Albert's army at Novara, March 23, 1849, the Austrians concentrated their efforts upon the subjugation of Rome and Venice, the national movement being soon after that battle crushed in almost every other part of Italy. Gen. Haynau, who operated against Venice at Mestre, in vain summoned Manin to surrender; he also scorned to entertain the overtures for negotiation made by Radetzky in the beginning of May, 1849, notwithstanding the critical condition of the city. After a severe bombardment, Fort Malaghera, one of the forts outside of Venice, fell into the hands of the Austrians, May 26; but Manin, encouraged by the victories of the Hungarians over their common enemies, still held out, although the inhabitants were exposed to the incessant fire of the Austrians and to the pangs of famine and distress, while the cholera raged in the city. Rome was obliged to surrender to the French on July 3. Venice, however, continued its resistance, and it was not until the city was completely surrounded by the enemy, its provisions entirely exhausted, and the news of Görgey's surrender had arrived, that Manin consented to negotiate; and even then (Aug. 23) he agreed only to a capitulation, after having secured favorable terms which granted an amnesty to all that had taken part

in the conflict, excepting 40 of the most conspicuous defenders of the city, including of course himself, who were compelled to withdraw before the entrance of Radetzky (Aug. 30). Manin thus had the honor of continuing the contest long after it had ceased in other parts of Italy, while his administrative genius and unselfish wisdom received universal admiration. He spent the rest of his life in exile in Paris, supporting himself by giving lessons in Italian. His motto, "Independence and national unity," he held to till the last. He occasionally expressed his views in the *Presse*, *Siccle*, and *Estafette* newspapers of Paris, in the "Times" and "Daily News" of London, and in the *Diritto* of Turin. His health had long been failing, and his death was hastened by that of his wife, and by that of his accomplished daughter in 1855, at the age of 17. He was buried at Montmartre. The French government did not interfere with the publicity of the funeral, which was attended by a vast concourse of people, including many of the most eminent native and foreign population of Paris. A *Histoire de la république de Venise sous Manin*, by Anatole de la Forge, has since been published in Paris.—The son of Manin took an active part in the Sicilian expedition of Garibaldi in May, 1860, and at the head of a body of soldiers he cooperated with the 7th column of Garibaldi, formed of volunteers from Pavia, and the 8th, composed of patriots of Bergamo, in compelling the Neapolitan general Landi, with a column of 8,500 men, to abandon his strong position at Calatafimi (May 15). This engagement, which determined the victory of Garibaldi, was described by one of the officers as a fight of lions. The young Manin and a son of Garibaldi were among the wounded, and among the principal heroes of the day.

MANIOC, MANDIOCA, or CASSAVA. See **CASSAVA**.

MANIS, an edentate animal of Asia and Africa. See **PANGOLIN**.

MANITOU, among some tribes of the American Indians, the name of any object of worship. "The Illinois," wrote the Jesuit Marest, "adore a sort of genius, which they call manitou; to them it is the master of life, the spirit that rules all things. A bird, a buffalo, a bear, a feather, a skin—that is their manitou." "If the Indian word manitou," says Palfrey, "appeared to denote something above or beside the common aspects and agencies of nature, it might be natural, but it would be rash and misleading, to confound its import with the Christian, Mohammedan, Jewish, Egyptian, or Greek conception of Deity, or with any compound of a selection from some or all of those ideas." The word was applied to any object used as a fetich or an amulet.

MANITOULIN, a group of islands in the N. part of Lake Huron, belonging chiefly to British America, the principal of which are Great Manitoulin, or Sacred island, the largest, about 90 m. long by from 5 to 30 broad; Little

Manitoulin or Cockburn, 7 m. in diameter; and Drummond's, 24 m. long by from 2 to 12 wide, and separated by a channel hardly 1 m. wide from Michigan, to which it belongs; pop. of the whole about 2,000, principally Indians. Great Manitoulin has thick and extensive pine forests, and contains a great deal of fine scenery.

MANITOWOC, an E. co. of Wis., bordering on Lake Michigan, and drained by the Manitowoc, E. and W. Twin, and Sheboygan rivers; area, 612 sq. m.; pop. in 1855, 18,048. The soil is fertile, and the county is heavily timbered, pine lumber being the principal article of export. Aggregate value of real and personal estate in 1855, \$1,889,250. Capital, Manitowoc.

MANLEY (DE LA RIVIERE), Mrs., an English authoress, born in Guernsey about 1670, died in London, July 11, 1724. She was the daughter of Sir Roger Manley, governor of the island of Guernsey, who, dying when she was young, committed her to the care of a relative. The latter, who had already another wife, enticed her into a marriage with himself and deserted her in London. The duchess of Cleveland, one of Charles II.'s mistresses, then took her under her protection, but with characteristic fickleness soon deserted her. In this emergency she retired from the world, and as a means of support began to write for the stage. Her "Royal Mischief," a tragedy represented at Lincoln's Inn Fields theatre in 1696, brought her into great literary repute, and she almost immediately became the centre of a brilliant circle of wits and men of fashion, in whose profligate course of life she was induced to embark. Although engaged in numerous intrigues, she did not neglect her literary pursuits, and soon produced her "Memoirs of the New Atalantis," a romance in 4 vols., describing with much freedom of language and under feigned names the amours of several distinguished characters. The work created so much scandal that a criminal prosecution was commenced against the printer and publisher, to screen whom from punishment she voluntarily declared herself in the court of king's bench the sole author. She was in consequence imprisoned for a time, but was subsequently released on bail. Upon the accession of the tories to power in 1711, she resumed her position as a wit and leader of fashionable profligacy, and employed her pen also with effect in behalf of the ministry, under the direction, it is said, and with the approval of Swift. The "Vindication of the Duke of Marlborough" and other political pamphlets testify to her industry in this department of literature; and she also conducted the "Examiner" for some time after it had been relinquished by Swift, and frequently finished pieces begun by him. Among her remaining works are: "Lucius, the First Christian King of Britain," a tragedy, for which Steele wrote the prologue and Prior the epilogue; the comedy of the "Lost Lover, or the Jealous Husband;" and a variety of novels, memoirs, dramas, and poems, now quite forgotten. During the last few years of her life

she lived with her printer, John Barber, an alderman of London.

MANLEY, JOHN, an American naval commander, born in 1784, died in Boston in 1793. At the outbreak of the revolutionary war he had command of the armed schooner *Lee*, with which he cruised along the coast of Massachusetts bay, making captures of great value to the American army then investing Boston. Among these was an ordnance brig laden with heavy guns, mortars, and intrenching tools. In Aug. 1796, he was commissioned as a captain by congress; and in July, 1778, his ship, the *Hancock*, was captured by a British frigate of superior strength. After a rigorous confinement in Halifax, he was exchanged, and in 1782 was put in command of the *Hague* frigate, which, after lying in a perilous position on a sand bank off Guadeloupe for 3 days, exposed to the fire of 4 British ships of the line, contrived to effect her escape. This exploit closed the regular maritime operations of the United States during the revolutionary war. Capt. Manley was subsequently tried by a court martial on a variety of charges, from which he was not entirely absolved.

MANLI, one of the most celebrated patrician *gentes* of ancient Rome, members of which held high offices in the state for about 5 centuries. The first who attained to the consulship was Cneius Manlius Cincinnatus, consul in 480 B. C., who fell in battle against the Etruscans.—MARCUS MANLIUS CAPITOLINUS, consul in 392 B. C., put to death in 381, obtained his surname, according to Livy, from his defence of the capitol against the Gauls in 390. Roused from sleep by the cackling of the sacred geese, he hastily collected a force, and repulsed the enemy, who had already gained the summit of the hill. He incurred the enmity of the patricians by his defence of plebeian debtors, was accused of aiming at the kingly power, and was for a time imprisoned. After his liberation, he instigated the plebeians to take up arms, but was arraigned for high treason before the people in the Campus Martius, was condemned to death, and was thrown from the Tarpeian rock. The Manlian *gens* determined that the name of Marcus should be conferred in future upon none of its members.—The Torquati and Vulsones were families of the Manlian *gens*.

MANLY, BASIL, D.D., an American clergyman, born near Pittsborough, Chatham co., N. C., Jan. 28, 1798. He was graduated at the South Carolina college in 1821, and commenced preaching in Edgefield district, S. C., whence he removed in 1826 to Charleston, to take charge of the Baptist church. He became president of the university of Alabama in 1837, and having filled that post for nearly 20 years, resigned it owing to enfeebled health. He soon took charge of another church in Charleston, which he subsequently gave up to engage in missionary travels throughout Alabama, in which he is now (1860) engaged. He bore an important part in the movements which led to the organization of the

southern Baptist convention in 1845, and in the establishment of the southern Baptist theological seminary at Greenville, S. C., in 1858.

MANN, A. T., a Flemish antiquary and physicist, born about 1740, died in the early part of the present century. He early embraced a monastic life, but about the age of 35 procured his secularization, and thenceforth devoted himself exclusively to antiquarian researches and scientific pursuits. He is the author of a work on the means of protecting buildings against fires, of an elaborate description of Brussels, an introduction to geography, a series of chronological tables from 1700 to 1802, &c., and of a number of useful memoirs and dissertations on the physical aspects of the Netherlands, the congelation of sea water, &c.

MANN, HORACE, LL.D., an American statesman and educationist, born in Franklin, Norfolk co., Mass., May 4, 1796, died at Yellow Springs, Greene co., Ohio, Aug. 2, 1859. His father, Thomas Mann, was a farmer in limited circumstances, and the education of the son was obtained entirely from the common district schools until the age of 20, when he began to prepare for college, and in 6 months fitted himself to enter the sophomore class of Brown university, Providence, R. I., to which he was admitted in Sept. 1816. He was graduated in 1819 with the highest honor, and the theme of his oration foreshadowed his future career; it was on "The Progressive Character of the Human Race." He now entered an office in Wrentham as a student of law, but at the end of a few months he was invited back to college as a tutor in Latin and Greek. In the latter part of 1821, having resigned his tutorship, he entered the law school of Litchfield, Conn., where he studied for a year. He then entered the office of Mr. Richardson of Dedham, where he completed his studies, was admitted to the bar in Dec. 1823, and immediately opened an office in Dedham. In 1824 he was selected as fourth of July orator in Dedham, and in 1826 delivered a eulogy on Presidents Adams and Jefferson, who died July 4 of that year. In 1827 he was elected a representative to the legislature from Dedham, by the national republican or whig party. His first speech in the house was in favor of religious liberty, and his second in behalf of railroads, which is believed to be the earliest speech on that subject made in any legislative body in the United States. From this time Mr. Mann became a leading member of the house, and took an active part in the discussion of all important questions, especially such as related to morals, public charities, education, or the welfare of the poor, the ignorant, or unfortunate classes. He was foremost in procuring the enactment of laws for the suppression of intemperance and the traffic in lottery tickets, and for improving the system of common schools. He was a member of the committee which reported the resolves that subsequently resulted in the codification of the statute laws of Massachusetts. The establishment of the state lunatic

hospital at Worcester was conceived, sustained, and carried through the house by him alone, against the direct opposition of some prominent members. He moved the appointment of the original committee of inquiry, and made its report, drew up and reported the resolve for erecting the hospital, and made the only speech that was delivered in its favor. After the law was passed, he was made chairman of the board of commissioners to superintend the erection of the hospital; and when the buildings were completed in 1833, he was appointed chairman of the board of trustees for administering the institution. Mr. Mann continued to be returned by large majorities as a representative from Dedham until 1833, when he removed to Boston and entered into partnership with the Hon. Edward G. Loring, now a judge of the U. S. court of claims. At the first election after he became a citizen of Boston he was chosen a member of the state senate, and by reelections was continued a senator for 4 years. In 1836 and again in 1837 he was elected president of the senate. During this period he was a member and for a part of the time chairman of the legislative committee for the revision of the state statutes; and a large number of most salutary provisions were incorporated into the code at his suggestion. After the revised statutes were enacted, he was appointed in conjunction with Judge Metcalf to edit the work, for which he prepared the marginal notes and the references to judicial decisions.—At the organization of the Massachusetts board of education, June 29, 1837, he was elected its secretary, and for the next 11 years was annually reelected by the unanimous vote of the board. On accepting this office he withdrew from all other professional and business engagements, transferred his law business then pending, declined reelection to the senate, abstracted himself entirely from political parties, and while he held it never attended a political caucus or convention of any kind, resolving to be known only as an educationist. He commenced at once a vigorous and thorough reform in the school system of the state. Extensive changes in the law relating to schools were proposed and adopted; normal schools were established; school committees were paid; a system of county educational conventions was instituted; by means of "school registers" the actual condition of the schools was ascertained, and the same object was promoted by the detailed reports which the school committees were now required to make. Of these reports abstracts were made by the secretary with immense labor, but also with immense benefit to the cause of education, and embodied in his annual reports a series of remarkable documents, the first of which, written within 6 months after his appointment, excited great attention among the friends of education. In 1843, under the auspices of the board, but at his own private expense, Mr. Mann visited Europe, to examine schools and to obtain such information as could be made available at home.

His 7th annual report, made on his return, embodied the results of this tour. Probably no other educational document ever had so wide a circulation. Many editions were printed, not only in Massachusetts, but in other states, sometimes by order of legislatures, sometimes by private individuals. Several editions were printed in England. In the autumn of 1844 a pamphlet of 144 pages appeared in Boston, bearing the names of 31 of the Boston schoolmasters, and entitled "Remarks on the Seventh Annual Report of the Hon. Horace Mann," contesting several of his facts and impugning some of his views, especially on the subject of school discipline, in which he advocated the disuse of corporal punishment. He immediately replied in a pamphlet of 176 pages. In May, 1845, a portion of the Boston teachers rejoined in another pamphlet of 215 pages, and in July following Mr. Mann replied in one of 124 pages. This closed the controversy, the result of which was a triumphant victory on the part of Mr. Mann. Public opinion, which had followed the contest with unusual interest, compelled the teachers to adopt in practice his views on discipline and corporal punishment. During his secretaryship Mr. Mann wrote 12 long annual reports, of one of which, the 10th, the "Edinburgh Review" said: "This volume is indeed a noble monument of a civilized people; and if America were sunk beneath the waves, would remain the fairest picture on record of an ideal commonwealth." From an immense mass of documents he prepared 11 abstracts of the Massachusetts school reports and returns, 6 of which are large 8vo. volumes in fine print. The "Common School Journal," which he edited and much of which he wrote, consists of 10 vols. 8vo. He published a volume of lectures on education, at the request of the board. He travelled over the state every year to hold conventions or teachers' institutes, at which he often taught all day and then lectured in the evening. His correspondence was more voluminous than all his other writings, and sometimes amounted to 30 letters a day. He was continually called upon for legal opinions in regard to school matters, which he always gave gratuitously; and whenever the cases in which they were given were brought before the courts, his opinions were invariably sustained. He superintended the erection of two state normal school houses, and drew plans and gave directions for hundreds of others. He says in his "Supplementary Report" in 1848: "From the time when I accepted the secretaryship in June, 1837, until May, 1848, when I tendered my resignation of it, I labored, in this cause, an average of not less than 15 hours a day; from the beginning to the end of this period, I never took a single day for relaxation, and months and months together passed without my withdrawing a single evening from working hours to call upon a friend. My whole time was devoted, if not wisely, yet continuously and cheerfully, to the great trust confided to my hands." Only

in a single instance was any public appointment made by him during this whole period unfulfilled, and in that case his physician forbade his rising from a sick bed to meet it.—John Quincy Adams, who represented in congress the district in which Mr. Mann resided, died Feb. 23, 1848, and Mr. Mann was nominated as his successor by the whig party, and chosen by a large majority. On June 30 he made his first speech in congress in maintenance of the right of that body to legislate for the territories of the United States, and its duty to exclude slavery therefrom. In the ensuing November he was re-elected, receiving 11,000 out of 18,000 votes. During his first session he volunteered as counsel for Drayton and Sayres, indicted for stealing 76 slaves in the district of Columbia, and at the trial was engaged for 21 successive days in their defence. In 1850 he engaged in an animated controversy with Daniel Webster in regard to the extension of slavery and the fugitive slave law, and Mr. Webster's famous speech of March 7 of that year. At the ensuing election in November Mr. Webster's friends succeeded in the whig convention in defeating by a single vote Mr. Mann's renomination. He, however, appealed to the people as an independent anti-slavery candidate, and after an exciting canvass, in which, contrary to the usage then prevailing in Massachusetts, he addressed meetings in his own behalf, he was reelected. His last speech in congress was on the slavery question, and was made Aug. 17, 1852. Editions of it were printed in various parts of the country, and more than 100,000 copies were sold.—On Sept. 15, 1852, the state convention of the free soil party of Massachusetts, assembled at Lowell, nominated Mr. Mann for governor, and on the same day he was chosen president of Antioch college, a new institution just established at Yellow Springs, Greene co., Ohio. He was not elected governor, but his popularity in Massachusetts was shown by the fact that his vote was 80 per cent. greater than that given for the other free soil candidates. He accepted the presidency of Antioch college, and continued there till his death, laboring with his usual zeal and energy in the cause of education and philanthropy. He carried the institution triumphantly through its early pecuniary and other difficulties, which were of no ordinary magnitude, and satisfied himself by the experiment that a college for the common education of both sexes was entirely practicable.—Beside his annual reports, his volume of lectures on education, and his voluminous controversial writings, the principal work published by Mr. Mann was entitled "Slavery: Letters and Speeches" (Boston, 1851).

MANNA, the concrete juice of several species of ash of the genera *ornus* and *fraxinus*, as the *O. europæa*, *O. rotundifolia*, *F. excelsior*, and *F. parviflora*. The juice exudes in the summer months, either spontaneously or through incisions made for the purpose in the bark, and is collected in leaves placed as cups to re-

ceive it; or it forms incrustations upon twigs, straws, and leaves placed under the trees. It is an article of import for the sake of its medicinal qualities, and is obtained chiefly from Sicily and Calabria. The best is of a whitish or light yellow color in flakes and tears, while the poorer sorts are darker colored from the impurities with which they are mixed. It possesses a sweet, somewhat nauseous taste, and is soluble in water or in alcohol. From its boiling saturated solution it separates on cooling in crystalline form. It consists of a crystallizable sweet principle called mannite, which sometimes amounts to 75 per cent.; of true sugar; and of a yellow nauseous matter, which it is supposed gives to the manna its purgative property. For the sake of this it is used in medicine, and is commonly prescribed with other purgatives, as senna, rhubarb, magnesia, &c., the taste of which it conceals, while it increases their effect.—A substance called manna is obtained by the Bedouin Arabs in the form of an exudation from the *tamaris gallica mannifera*. After collecting it from among the twigs and leaves, they boil it, then strain it through cloth, and put it away in leathern bags to be eaten like honey with bread, as a delicate article of food. Dr. Robinson, in his "Biblical Researches in Palestine," mentions its being collected in small quantities by the Arabs of Mt. Sinai, and sold at very high prices to the Russians.—Though the name is probably derived from the Syriac *mano*, a gift, which was applied to the scriptural manna, it cannot be proved that there is any relationship between the natural products designated by this name and the substance mentioned in Scripture as miraculously supplied to the Israelites, and of which we possess no information by which we can identify it.

MANNHEIM, or MANHEIM, a German town, in the grand duchy of Baden, capital of the province of the Lower Rhine, situated on the right bank of the Rhine, at the confluence of the Neckar with that river, 11 m. by railway N. W. from Heidelberg, 64 m. N. from Baden-Baden, 94 m. N. E. from Strasbourg, and 54 m. S. from Frankfort-on-the-Main; pop. in 1856, 25,500. It is connected by steamers with Cologne and other parts of the Rhine, and by railway with the principal towns of Europe. Goethe has appropriately called it "the pleasant, clean Mannheim." The regularity of the buildings, however, gives to the town a somewhat monotonous appearance. It consists of 11 straight streets, crossed by 10 other streets at right angles, forming 110 regular squares. It is divided into two parts by the great street leading from the palace to the suspension bridge over the Neckar. The principal public squares are the Paradeplatz (where Schiller resided in the house called *zum Karlsberg*) and Marktplatz, adorned with monuments and fountains. Behind the palace, which contains collections of art and a cabinet of natural history, are beautiful gardens, ending in a raised terrace upon the brink

of the Rhine (*Rheindamm*). Along the banks of the Neckar, in the outskirts of the town, are handsome private gardens, and a broad avenue (*Plankenstrasse*) between the Heidelberg and Rhine gates is planted with trees. The town was formerly the capital of the Palatinate. It suffered severely in the 30 years' war, and was almost destroyed by the French in 1688 after a siege of 17 days. The town was soon rebuilt, and was fortified in 1699 after the system of Coehorn. Its present prosperity is mainly due to the elector Charles Theodore, who made it the capital, but after 1777 the government was transferred to Carlsruhe. During the wars of the revolution, the French attacked the town in Dec. 1794, and took formal possession of it in 1795. In 1799 it was occupied for a short time by the Austrians, after whose departure the French reentered it. In virtue of the arrangements which were made subsequent to the treaty of Lunéville, Mannheim was allotted to Baden in 1803.

MANNING, HENRY EDWARD, an English clergyman and author, born about 1812. He was educated at Balliol college, Oxford, was chosen fellow of Merton, and obtained the living of Lavington in Sussex. He was next made archdeacon of Chichester, and published several volumes of sermons. The Gorham decision, leaving the doctrine of the effect of baptism an open question in the church of England, called forth a declaration from him, and other well known clergymen and laymen of the establishment, that, unless that decision was formally repudiated, it would be of binding force upon the English church. They strove to free that which they conceived to be the church of Christ from submission to a doctrinal decision given by the crown. Their attempt, however, was without result, and, with the exception of one or two protests, the action of the court was acquiesced in. Dr. Manning, first giving up his archdeaconry and vicarage, and then spending some time in seclusion, was received into the Roman Catholic church in 1851. Shortly after he embraced the ecclesiastical state, and after living some time in Rome, he returned to England, where he has been engaged in clerical labors. He has been made provost of the chapter of Westminster, and has founded a congregation of secular priests called the Oblates of St. Charles, modelled upon the rules of St. Charles Borromeo. They have two missions in London, one at St. Mary of the Angels, Bayswater, and the other at Westminster. Beside several volumes of sermons, Dr. Manning has published a treatise "On the Unity of the Church," "Lectures on the Grounds of Faith," &c.

MANNING, JAMES, D.D., an American clergyman, and first president of Brown university, born in Elizabethtown, N. J., Oct. 22, 1738, died in Providence, R. I., July 29, 1791. He was graduated at Princeton college in 1762, and in the following year became pastor of a Baptist church at Morristown, N. J. About a year later he accepted an invitation to become

pastor of a church in Warren, R. I., and almost immediately commenced a Latin school, which seems to have been in some sense the germ of Rhode Island college. He had previously, at the request of an association formed for the purpose in Philadelphia, proposed to several influential gentlemen of the denomination, assembled at Newport, the organization of "a seminary of polite literature, subject to the government of the Baptists," and had drawn up a plan for such an institution. In 1764 the legislature granted them a charter, and in 1765 Mr. Manning, then but 27 years of age, was appointed "president and professor of languages and other branches of learning, with full power to act in these capacities, at Warren or elsewhere." The college went into operation at Warren in 1766, and the first commencement was held there in 1769, when a class of 7 was graduated. In 1770 it was determined to remove the college to Providence, and Mr. Manning removed with it. During the revolution, when the college edifice was occupied as a military barrack, and afterward as a hospital, he was actively engaged in clerical duties, and also rendered important services to the patriotic cause. In 1788 he resumed his duties at the college, and in 1786 he was chosen to represent Rhode Island in congress. He exerted himself in favor of the adoption of the present national constitution. From 1770 till the year of his death he was also pastor of the first Baptist church in Providence. He resigned the presidency of the college in 1790.

MANOMETER (Gr. *μετρον*, thin or rare, and *μετρον*, measure), an instrument for measuring the rarity of elastic fluids, more especially that of the air. While the barometer gives the pressure of the superincumbent column of air, the manometer indicates also the amount of expansion caused by increase of heat. Robert Boyle made a very simple form of manometer, which he called the statical barometer, by suspending a light glass globe exhausted of air at one end of the beam of a delicate balance, and exactly counterpoising it with a weight when the barometer stood at 30 inches. The buoyancy of this globe changed with the varying density of the medium in which it was suspended; as the atmosphere became rarer the globe descended, and as the density of the air increased it rose. Other manometers have been contrived to correct the mercurial barometer by showing what proportion of the movement of its column is due to change of temperature, and what to variation in the pressure of the atmosphere induced by other causes. Ramsden constructed one of a glass tube of small bore, like a thermometer tube, and having a bulb blown at one end, the other remaining open. Into this, the pressure of the atmosphere being known, he introduced a small portion of mercury, which was supported by the air in the lower part of the tube and bulb, and cut off the communication of this with the external air, while the barometric pressure continued the same. The effect induced

by changes of temperature were then marked upon a scale attached to the tube in degrees corresponding to those of Fahrenheit's thermometer. The instrument is now an air thermometer, but correct only under the same atmospheric pressure. If this diminishes, the enclosed air expands and stands at a higher degree than the mercury in the common thermometer; so if the atmosphere becomes heavier, the manometer falls by the air it contains being compressed, even though the ordinary thermometer in the same time may have risen by increase of temperature. From both these instruments the height of the barometer may be determined.—For indicating pressures greater than that of the atmosphere, a column of mercury in a glass tube is variously employed. Under the ordinances of the French government of 1843 and 1846 the boilers of stationary engines employing an effective pressure not exceeding that of 4 atmospheres, and those of steamboats using a similar pressure not exceeding that of 2 atmospheres, were required to be provided with a manometer consisting of a long upright tube open at the top and connected below with the boiler, a stopcock shutting off this connection as desired. For higher pressures another form of manometer was allowed, in which the tube filled with air is closed at the top and dips below into a bath of mercury upon which the pressure of the steam is applied. The scale is divided according to Mariotte's law of æriform fluids being compressed in proportion to the power applied. This is a common form of steam gauge, but like that of the open tube it is defective in consequence of the glass soon becoming dim by oxidation of the mercury at the surface. It is also liable to become inaccurate by portions of air occasionally escaping when the pressure is off, and by the steam insinuating itself between the mercury and the glass and condensing in the upper part. To obviate these and other defects, a great variety of manometers have been devised for the special use of steam gauges.

MANRESA, a town of Spain, in the province of Barcelona, 80 m. N. N. W. from the city of Barcelona; pop. 13,389. It is one of the most picturesque towns of Catalonia and the centre of a rich farming district, beside which it has extensive manufactures of broadcloth, cotton, silk, tape, ribbons, gunpowder, and brandy. The streets are crooked, and lined with quaint old-fashioned houses; but there are some elegant churches and other public buildings, and in the neighborhood is the famous monastery of Montserrat, and the "cave of St. Ignatius," where Loyola passed some time in retirement before founding the society of Jesus. Manresa was taken by the French under Macdonald in 1811, when more than 800 buildings were burned, including hospitals and churches. This wanton act so incensed the Catalans, that they fell upon the rear of the French army on its march to Barcelona, and destroyed 1,000 men.

MANS, LE, a town of France, capital of the

department of Sarthe; 132 m. S. W. from Paris, on the W. bank of the river Sarthe, here crossed by 8 bridges; pop. in 1856, 81,162. It consists of an old town and a new town, and has a considerable trade. It is a place of great antiquity, having been founded in the 2d century A. D. by the Romans, and called Suindinum or Cenomani, after the Gallic people of the same name, in whose territory it was situated. During the war of the league Le Mans was captured by Henry IV., and in 1793 it was the scene of the destruction of the Vendean army, when upward of 10,000 persons were slaughtered.

MANSSEL, HENRY LONGUEVILLE, an English metaphysical and theological writer, born about 1815. He was educated at Oxford, became a fellow of St. John's college, in which he is still a tutor, and has also filled the office of Waynflete professor of moral and metaphysical philosophy. His first publication was a small volume entitled "Demons of the Wind, and other Poems" (1838). In 1851 he produced his *Prolegomena Logica*, a philosophical introduction to logic, and prepared an edition of Aldrich's *Artis Logica Rudimenta* (8d ed., 1856). In 1856 he delivered at Oxford a "Lecture on the Philosophy of Kant," which was printed, and designed by its brevity to attract readers who would be deterred by a more elaborate exposition. His most important work is the Bampton lectures delivered before the university of Oxford in 1858, and published under the title of "The Limits of Religious Thought." His object was to determine whether there exists "in the human mind any direct faculty of religious knowledge, by which, in its speculative exercise, we are enabled to decide, independently of all external revelation, what is the true nature of God, and the manner in which he must manifest himself to the world; and by which, in its critical exercise, we are entitled authoritatively to decide for or against the claims of any professed revelation, as containing a true or false representation of the divine nature and attributes." His negative answer to this inquiry is founded upon Sir William Hamilton's principle that thought can deal only with what is conditioned and plural, not what is absolute and single, and that the infinite, as such, cannot be known. The work immediately passed through several editions, and is the most important application that has been made of the philosophy of the conditioned to questions of religion. Mr. Mansel was one of the editors of the academical lectures of Sir William Hamilton (1859), and is the author of the article on "Metaphysics" in the 8th edition of the "Encyclopædia Britannica," which was reproduced separately in 1860. He has also published "The Limits of Demonstrative Science Considered," and an inaugural lecture entitled "Psychology the Test of Moral and Metaphysical Philosophy."

MANSFELD, an ancient family of German nobility, taking its name from the castle of Mansfeld now belonging to Prussian Saxony.

Among its distinguished members were: I. PETER ERNST, count of Mansfeld, born in 1517, died in Luxemburg in 1604. The greater part of his life was spent in the service of the emperor Charles V., and of his son Philip II. of Spain, who employed him in various important military and administrative capacities. Having been appointed governor of Luxemburg, he maintained that province in tranquillity at a time when the other provinces of the Netherlands were a prey to civil and religious commotions. In 1592 he succeeded the duke of Parma as governor-general of the Netherlands. II. ERNST, natural son of the preceding, born in 1585, died near Zara, Dalmatia, Nov. 20, 1626. He was educated by his godfather, the archduke Ernest of Austria, and for his military services to the emperor Rudolph II. and Philip III. of Spain was legitimized by the former. But having been denied the dignity and estates of his father, which had been promised to him, he embraced Calvinism, and subsequently became one of the most formidable enemies of the house of Austria, by which he was called the Attila of Christendom. At the commencement of the 30 years' war, he joined the elector palatine Frederic, elected by the Protestants king of Bohemia, and vigorously opposed the imperial forces in Bohemia, and also on the Rhine, where he ravaged the territories of the Catholic princes, and became a terror to his enemies. Though repeatedly beaten, he came forth so formidable from every defeat, that, when fighting for a desperate cause and lying under the ban of the empire, he found himself courted at the same time by the kings of Spain, France, and England, and the republics of Holland and Venice. In 1625 he succeeded in raising subsidies in England, and landed in Holland with considerable reinforcements, with the design of invading the hereditary possessions of the house of Austria. Defeated by Wallenstein at Dessau in April, 1626, he nevertheless pursued his march to Hungary, to effect a junction with Bethlen, the Protestant prince of Transylvania. But being unable to join his ally, he formed the design of reaching England by the way of Venice, and died on the march at a village in Dalmatia, leaning in full military array upon the arms of his officers. With the exception of Gustavus Adolphus, he was the ablest general on the Protestant side in the 30 years' war.

MANSFIELD. I. A township and post village of Tolland co., Conn., on the Natchaug river, and the New London, Willimantic, and Palmer railroad, 24 m. E. from Hartford; pop. in 1850, 2,517. It is chiefly noted for the production of silk, in which it surpasses any other place in the United States. It was introduced by Dr. Aspinwall, and in 1793 there were raised 265 lbs.; in 1827, 2,431; in 1830, 10,000; and in 1850, 25,000 lbs. In 1850 there were 5 silk factories, 2 cotton factories, 1 woollen factory, 4 grist mills, 5 saw mills, and 8 tanneries. II. The capital of Richland co., Ohio, on the Pittsburg, Fort Wayne, and Chicago, the At-

lantic and great western, and the Sandusky, Mansfield, and Newark railroads, 45 m. from Sandusky, and 193 from Cincinnati; pop. in 1850, 8,557; in 1860, about 6,000. It contains 70 stores, 6 manufactories, a branch of the state bank of Ohio, 2 weekly newspaper offices, 11 churches, and a large union school with an average attendance of 900 pupils.

MANSFIELD, WILLIAM MURRAY, earl of, a British jurist and statesman, born in Scone, Perthshire, March 2, 1705, died March 20, 1798. He was the 3d son of Viscount Stormont, a Scottish peer of Jacobite tendencies, several of whose family became deeply involved in the rebellion of 1745. Removed to London at an early age, he was educated at Westminster school, and thence passed to Christchurch college, Oxford, where he had a reputation for classical learning, and distinguished himself by a Latin oration in praise of Demosthenes. In 1731 he was called to the bar, and at the same time, being of a vivacious temperament, with the advantages of aristocratic connections and signal personal graces, he became a companion of wits and men of letters, and in particular gained the friendship of Pope. Almost at the outset of his career a new class of business, that of appeals from the court of session in Scotland to the house of lords, fell into his hands, and so large became his emoluments that he is said to have remarked that he never knew the difference between absolute want of employment and a professional income of £3,000 a year. Being now, in the words of his friend Pope, "so known, so honored in the house of lords," he was enabled, by the accidental illness of his senior counsel in the crim. con. action brought by Theophilus Cibber against Mr. Sloper, to show his abilities in a common law cause; and so skilful was his management of the defence that the jury gave but £10 damages to the plaintiff. His advance was thenceforth rapid, and in 1748 he was appointed solicitor-general, having the year previous entered parliament for Boroughbridge, for which place he was afterward returned in 1747 and again in 1754. As a legislator he displayed an eloquence "of which the clear, placid, and mellow splendor was never for an instant overclouded," and a depth and variety of knowledge which brought him into great prominence, at the same time that his peculiar political views exposed him to the attacks of Pitt, who frequently taunted his rival with his Jacobite connections and presumed sympathies. In 1747 he was one of the managers for the impeachment of Lord Lovat, and performed his part in so generous a spirit as to elicit praise from the prisoner himself, who called him "an honor to his country," and wished that "his being born in the north might not hinder him from the preferment which his learning and merit deserved." In 1754 Mr. Murray was appointed attorney-general, and in 1756 succeeded Sir Dudley Ryder as chief justice of the king's bench. So important were his parliamentary services to his party, that extraordinary efforts were

made by the duke of Newcastle to retain him in the house of commons, as a government leader. He was offered various sinecure offices with large salaries, and finally a pension of £8,000 a year, but steadily refused them all, regarding the situation of chief justice as preferable to the responsibilities and labors which the chancellorship, the premiership, or any other merely political office involved, and distrusting probably his own ability to perform the functions of a party leader. Finally, upon threatening, in case the chief justiceship was withheld from him, to leave the ministry to fight their own battles in the house of commons, he was appointed to the office, and at the same time created Baron Mansfield of Mansfield in the county of Nottingham. Contrary to general usage, though not to precedent, he became at the same time a member of the cabinet; and in 1757, while temporarily holding the office of chancellor of the exchequer, at the request of the king he effected the coalition between Newcastle, Pitt, and Fox, which resulted in the celebrated first administration of Oatham, the crowning glory of English political history. He participated on important occasions in the proceedings of the house of lords, where Lord Camden and subsequently Oatham became his chief antagonists, and where at one time his opinions were probably held in greater deference than those of any other man living; but on questions affecting popular privileges or influence he showed a decided leaning toward an arbitrary government. The stamp act, which he aided in preparing, in particular found in him an earnest and able advocate, and the doctrine of taxation without representation was by no one more persistently defended. In reference to the agitation in the North American colonies which preceded the repeal of the act, he held that the Americans must first be compelled to submit to the power of parliament, and must exhibit "the most entire obedience" before an inquiry could be had into their grievances. The utterance of opinions like these marked him out as an object of popular dislike and party violence, and for many years he was attacked with a vindictiveness characteristic of the English press of that time, and which found its fullest expression in the letters of Junius, by whom "all the resources of the English language were exhausted in desolating and unpunished party libels on the chief justice of England." He nevertheless performed his judicial duties with dignity and courage; and on the occasion of the application of Wilkes in 1768 for the reversal of his outlawry, when public excitement had reached an almost unprecedented height, and the chief justice had been repeatedly threatened in anonymous letters, he announced to the partisans of Wilkes, who crowded Westminster hall, his contempt for the means that had been taken to deter the court from its duty. His unpopularity was still further increased by his direction to the jury in the trial of Woodfall, the publisher of Junius, "that the printing and sense of the paper were

alone what they had to consider of." This attempt to restrict the right claimed by juries, in criminal prosecutions for libel, of determining whether a paper was a libel or not, brought upon Lord Mansfield the charge of arrogating to himself the functions of a legislator rather than of an administrator of the law; and Junius in his letter of Nov. 14, 1770, said to him: "No learned man, even among your own tribe, thinks you qualified to preside in a court of common law; yet it is confessed that, under Justinian, you might have made an incomparable pretor." The subject also gave rise to a discussion between Lord Camden and himself, in which the former is held to have had clearly the advantage. In the Gordon or "no popery" riots of 1780 the popular odium was so strongly excited against him, that his house in Bloomsbury square, with its valuable library of books and manuscripts, his private papers, furniture, and other valuables, were utterly destroyed by the mob, from whose fury he only escaped by taking refuge in Buckingham palace. He bore these misfortunes with a calmness which seemed to disarm his enemies of their vindictiveness, declining any pecuniary compensation from the treasury; and during the remainder of his life parties generally united in a feeling of respect for his character and virtues. He retained his office of chief justice until 1788, having in the interim several times declined the chancellorship, and passed the last few years of his life in retirement. He left no children, and his title of earl of Mansfield, granted in 1792, descended to his nephew, Viscount Stormont, to whom the greater part of his large property was bequeathed. The title of Baron Mansfield expired with him.—As a jurist the character of Lord Mansfield contrasts favorably with the timidity and narrow-mindedness which marked his legislative career; and when not influenced by political views his decisions were almost uniformly correct. Commencing his judicial career as a reformer, he aimed at expediting legal proceedings, and by diminishing the expenses of suitors, and preventing unnecessary delays, caused the business of the courts, though greatly increased, to be despatched with unexampled rapidity. Sir James Burrow, in the preface to his reports, mentions that of the 800 causes set down in a year for the London and Middlesex sittings, all were disposed of. Gifted with an acute and powerful intellect, and with a wonderfully retentive memory, he was in the habit of considering the intent and spirit of the law rather than its letter; but his eagerness to discourage technicalities, and preference of the principles of the civil law, occasionally led him to make the law instead of expounding it. In constructing a system of jurisprudence and adapting a progressive state of society to circumstances and cases entirely new, he was eminently successful; and English commercial law, particularly that branch of it relating to marine insurance, will be an enduring monument of his genius and industry. His conduct on the bench was

marked by great dignity and amenity of manners, and in general he showed himself so worthy of his high office that Lord Chatham, for many years his determined political opponent, comparing him with two of the most illustrious British jurists, Somers and Holt, exclaimed: "I vow to God, I think the noble lord excels them both in abilities." It deserves to be mentioned to his credit also, that, though opposed to liberal ideas, he was uniformly tolerant in matters of religious opinion. His personal appearance was striking—"his countenance beautiful, inspiring reverence and regard; his eye gleaming with light; his voice acutely clear, yet varied and musical; his manner graceful and engaging." His arguments and decisions are preserved in Atkins's, Burrows's, Douglas's, and Cowper's reports; and his life has been written by Henry Roscoe and Lord Campbell.

MANSLAUGHTER. In the article *HOMICIDE*, it is said that felonious homicide is either manslaughter or murder. These two are distinguished from each other by the intent which causes or accompanies the act. If a homicide be not justifiable nor excusable, and yet be not committed with malice aforethought, it is manslaughter. It is quite certain that the intent need not be to kill; for while there must be a criminal intent to make a person amenable to law as a criminal, yet if one crime be intended, and in the act of committing it another of a higher character be also committed without intent, the criminal is responsible for this higher crime. The general principle laid down in respect to manslaughter is, that not only a positive intention to commit some crime, but mere negligence, may make one guilty. If any one take upon himself an office or duty requiring care or skill, he is liable for the want of either; and if death be the consequence of his ignorance or carelessness, he is guilty of manslaughter. So if one driving furiously run over and kill a person whom he did not see, or if one in command of a steamer or sailing vessel by reason of gross negligence run down a boat and some one in it be drowned, this would be manslaughter. So if any one, whether medical by profession or not, deal with another as a physician, and through gross want of care or skill kill him; or if any one charged with building a house of any kind construct it so badly that it falls and kills persons within or near it; or if in building he drop a stone upon some one passing below, and kill him; in all these cases he would be guilty of manslaughter, provided he were grossly negligent in the act causing the death. This is the essential question; thus, in the last case, if he were building in a place where few persons were, and it was by a rare occurrence that some one happened to be where the stone fell, it is said that there would be no such negligence as would make the killer responsible as a criminal; while, on the other hand, if it were a crowded thoroughfare, and the person dropping the stone gave no notice

or warning and used no precaution to prevent mischief, the crime would then amount to murder. So if one ride a vicious horse, who kicks some one to death, it is no crime whatever if the rider did not know his character and did nothing by his carelessness to bring about the fatal result; but if he knew that the animal was vicious, and carelessly rode him near a crowd and exposed him to alarm likely to make him run into the crowd and do mischief, then the killing would be manslaughter. Sometimes it is said that if manslaughter be charged upon one on the ground of negligence only, without intent, this charge can be sustained only by evidence of the grossest negligence. It has been held that the mere omission to do an act cannot, although death ensue, make the man guilty of manslaughter. But if the omission were of an act which was certainly a duty, and such an act that any reasonable person must know that its omission would be very dangerous to life, the principles of criminal law would lead to the conclusion that this might be manslaughter. Thus, in a recent case of much interest, a man employed to wall a shaft in a colliery, and whose duty it was to place a stage over the mouth of the shaft, having omitted this, and a man being thereby killed, the court of king's bench held him guilty of manslaughter. It seems to be agreed that if the act omitted were a legal duty, it would certainly amount to that crime. It should be added that the law always presumes (in the absence of clear proof to the contrary) that a man intended to do the thing he actually did, and intended the consequences which naturally and actually flow from his act; and this principle applies even where the act causes death. So a very nice distinction is taken in law, between a *malum prohibitum* and a *malum per se*. Thus, if there be a law prohibiting the shooting of woodcocks before the 4th of July, one who shoots at one in June intends to break a law; but if, while thus shooting, by mere accident and without negligence, he should kill a man, this would be no crime, because shooting a woodcock at that season is an offence only because the law has made it so. But if he shoot at his neighbor's poultry, and by accident kill his neighbor, this is manslaughter; because the destroying his neighbor's property was an offence of itself, independently of municipal law. If one is insane he cannot make himself criminally liable; but if he voluntarily make himself insane, or if he be drunk from alcoholic liquors, or opium, or any similar drug, the law does not permit this to be an excuse, partly because it looks upon such intoxication or voluntary insanity as itself a wrong, and partly because it would be very dangerous to permit a criminal to shelter himself under any such excuse.—But by far the most frequent and most difficult questions in practice, are those which must be determined either by the means used to produce death, or by the presence or absence of previous hostile intention. It is a general rule, that if one kills another

with a deadly weapon, it is more than manslaughter; and it has been said authoritatively, that whether the weapon used be a deadly weapon or not, is not a question of fact for the jury, but a question of law for the court. (See *MURDER*.) The other question, as to previous hostility, generally turns upon the preliminary question, whether the act was committed in "the heat of passion," or under sudden provocation. If one, being angry, attacks another, his anger is not an entire excuse. But if a quarrel and conflict ensue, and the assailant kills the man whom he attacked, while this is a felonious homicide, it is not murder, because there is an absence of that malice aforethought which is of the essence of murder; and therefore it is manslaughter. Still further would it be from murder if the party killing had been himself attacked. But neither would this excuse the act if it were not made necessary by the nature of the attack; but it would reduce the crime to manslaughter. Here, however, it is to be remembered that such a quarrel makes that to be only manslaughter which would otherwise be murder, for no other reason than because it negatives the supposition of malice aforethought. If therefore this be proved—as if it be shown that the killer had a grudge against the deceased, and had manifested a violent hatred and intention to injure him—it might be inferred that he provoked the quarrel merely to give him the opportunity of gratifying his malice. In such a case the quarrel, instead of negating malice, would help to prove it; and therefore, of course, it could not have the effect of reducing the felony to manslaughter. So if there had been a quarrel and much provocation, and the quarrel had abated, and one of the parties withdrew and provided himself with a dangerous weapon, and returning killed the other, the excuse of "heat of passion" would not apply, for there would then be evidence of deliberate purpose. So, too, let the provocation be what it may, if there be no excitement or heat of passion, the killing will be deemed deliberate and intentional. Still, where there was much provocation, and no evidence of hostile purpose previous to the provocation, the killing itself would generally be deemed evidence of excited temper. There are other cases which the law regards as only manslaughter, without evidence of momentary excitement; partly because the law infers that from such a provocation there must be excitement; and partly, perhaps, because the party killed brought his death upon himself by his outrageous wrong. Thus, if a husband detects his wife in adultery, and instantly and purposely takes either her life or the adulterer's, it is only manslaughter. Not so, however, if he waits for a subsequent opportunity, for then the first reason wholly fails, and the killing becomes murder. In one English case, where a man had his pocket picked, and with the assistance of others threw the thief into a pond to punish him by a ducking, and the man was drowned,

this was held only manslaughter. It is said, however, by an American judge, that some regard must be had to the nature and origin of the provocation, as well as its extent; for if one were outraged and maddened by a libel, and thereupon should instantly kill the libellant, this would be murder; we still think, however, that if the excitement were such as to negative the presumption of malice aforethought, it would be only manslaughter. Questions of this kind are so frequent, and at the same time so difficult, that the legislatures of many of the United States have endeavored to aid in their determination, by discriminating between different classes and degrees of manslaughter, defining each degree, and affixing to it appropriate punishment. We have not space to speak of these in detail, but to illustrate the prevailing principles of classification refer to the statutes of New York. By these, four degrees of manslaughter are defined. The first degree, briefly stated, consists of killing without the purpose of death, when the deceased was engaged in perpetrating or attempting a crime less than felony, and where such killing would be, at common law, murder. Assisting in self-murder is manslaughter in the first degree, as also wilfully killing an unborn quick child by injury to the mother, if it would be murder in case the mother died from the injury. The second degree consists in procuring abortion otherwise; killing in the heat of passion without the intent of death, but in a cruel and unusual manner; or killing unnecessarily one attempting to commit felony. The third degree is killing in heat of passion, without intent of death, but with a dangerous weapon; involuntary killing, by procurement or negligence of another, while the person killed is engaged in committing a trespass on property; suffering an animal known to be mischievous to go abroad without care, or keeping it without care, and thereby causing death; receiving wilfully or negligently so many persons into a boat or vessel as to cause death; racing while in command of a steamboat carrying passengers, bursting the boiler, and so killing; killing by a physician while in a state of intoxication. The fourth degree may be said to include all other modes or forms of manslaughter, known as such at common law, and of a milder kind than the preceding.

MANTCHOORIA, or **MANTCHURIA**, the land of the Mantchoos, a country of Asia, mostly belonging to the Chinese empire, but partly to the Russians, bounded N. by the Yablonoi-Khrebet or Outer Hing-an mountains, which separate it from the Russian province of Yakootsk, E. by the channel of Tartary and sea of Japan, S. by Corea and the gulf of Pe-chee-lee, S.W. by the great wall, W. by Mongolia and the Inner Hing-an or Sial-Koi mountains, and N. W. by the Kerloo river and Daoorian mountains; between lat. 42° and 58° N., long. 120° and 142° E.; area, 700,000 sq. m.; pop. estimated at 7,000,000. A large part of this country is an uninhabited

wilderness, and but little of it has been visited by Europeans. Nearly the whole of it is drained by the Amoor river and its branches. That part which lies N. of the Amoor was ceded to Russia in 1854. There are 3 considerable lakes, the Hurun, which is 200 m. in circuit, the Pir, and the Kinka, which is 40 m. long and 25 m. broad. There are 3 principal mountain chains. The Sih-hih-tih mountains extend from the boundary of Corea, in lat. 40°, in a N. E. direction, along the sea coast to the mouth of the Amoor. Their average height is 4,500 feet, and they are covered with forests. Between them and the ocean there is only a narrow strip of arable land, which is inhabited by a savage race having little intercourse with the Mantchoos. The southern extremity of this range, from about lat. 43°, bears the Mantchoo name of Kolmin-Shanguinalin, and the Chinese name of Changpeh-Shan or Long White mountains. One of its peaks, called Pecha, is supposed to be 15,000 feet high. The second range is the Yablonoi-Khrebet, which is separated from the Sih-hih-tih on the N. by the valley of the Amoor. Its spurs extend a great distance and bear a variety of names. There are two principal spurs, one N. of the great bend of the Amoor, and the other between it and the Chikiri, one of its affluents. The third range, the Inner Hing-an or Sial-Koi, extends over a great part of Mongolia, and forms in Mantchooria 3 sides of the extensive valley of the Nonni, ending between the Amoor and the Soongari at their junction. Most of these ranges are covered with forests, but very little is known of their height or their natural history. The greatest part of Mantchooria is covered by forests, the abode of wild animals, many of which afford valuable furs. Among them are bears, wolves, tigers, and two peculiar species of deer, the *argali* and *jiggetai*. The rivers and coasts abound in fish; among which carp, sturgeon, salmon, pike, and shell fish are especially plentiful. The pearl fishery is carried on at the mouth of the Amoor by Chinese soldiers sent for the purpose. The troops of Chinese Mantchooria are required to furnish 2,400 stags annually to the emperor, who reserves for his own use only the fleshy part of the tail as a delicacy. Among the birds of prey is a vulture which in size and fierceness rivals its congener the condor of the Andes. The southern part of Mantchooria is cultivated, and produces wheat, barley, pulse, millet, and buckwheat. It also supports large herds of horses, cattle, and sheep. Ginseng and rhubarb are gathered by soldiers detached for the purpose.—Chinese Mantchooria is divided into 3 provinces, Shing-king, Kirin, and Tsitsihar. Shing-king occupies the S. portion of the country, Kirin all the region E. of the river Soongari, and Tsitsihar the north-west. Shing-king contains two departments, Fung-thian-foo and Kin-choo-foo, subdivided into 15 districts. There are 12 garrisoned posts. The administration of this province is partly civil and partly military, while that of the other

provinces is entirely military. The capital of Shing-king and of all Mantchooria is called Mookden by the Mantchoos, and by the Chinese Fung-thian-foo. It is 380 m. N. E. from Peking, and is a large city surrounded by a wall 10 m. in circuit. Hing-king, 60 m. E. of Mookden, is also a considerable city, and is the family residence and the family burial place of the Mantchoo emperors of China. Kin-choo, on the gulf of Leao-tong, S. W. of Mookden, of which it is the port, carries on a considerable trade in cattle, provisions, and drugs. Its harbor is shallow and unsafe. Kai-choo, another less frequented port on the E. side of the gulf, has a better harbor. Kirin is a very extensive province, and is thinly inhabited by Mantchoos settled in garrisons along the bottoms of the rivers, and by tribes related to the Mantchoos, but less civilized, who subsist principally by hunting and fishing, and are tolerably independent of government control except that they pay an annual tribute of furs. Ningoota is the largest town. The great island of Saghalien is included in this province. Tsitsihar is mostly an uninhabited mountainous wilderness. Its capital is Tsitsihar, on the river Nonni, in lat. 47°; it is a place of some trade, being generally resorted to by the tribes of a vast region. The climate of the greater part of Mantchooria is very severe. One of the early Jesuit missionaries who resided there says: "Although it is uncertain where God placed paradise, we may be sure that he chose some other country than Mantchooria; for of all savage regions this takes a distinguished rank for the aridity of the soil and rigor of the climate." In the northern parts the ground is frozen in winter to the depth of 7 feet, and the mercury is frequently 80° below zero. The administration of Mantchooria consists of a supreme civil government at Mookden, and 3 provincial military ones. There are 5 boards, each under a president.—The Mantchoos belong to the great Mongolian division of mankind, though they are not nomadic or pastoral like the Mongols proper, but occupy themselves with agriculture or hunting according to the circumstances of the part of the country they inhabit. They are of lighter complexion and heavier build than the Chinese, and some of them have florid complexions, blue eyes, aquiline noses, brown hair, and heavy beards. They have the same peculiar conformation of the eyelids as the Chinese, and resemble them closely in other respects; but their countenances are generally of a higher intellectual cast, and their character haughtier and more determined. They are the dominant race in the Chinese empire, and the skill and energy with which they have governed their vast dominions for two centuries show them to be possessed of high qualities. During the same period they have greatly improved the condition of their own original country; and although they have been dispersed over the whole empire as officers and soldiers, their number at home seems to be greater than at any former period. Their courage and resolution

were shown in repeated instances in the war with Great Britain in 1841-'2. At Chapoo, after the Chinese army was defeated, 800 Mantchoos retired into an enclosed temple, and defended themselves with such desperation that only 50 were taken alive. At Ohinkiang-foo the Mantchoos of the garrison made a gallant defence, and when they were overpowered they killed their women and children and then themselves. They preferred to die rather than to surrender, and of a Mantchoo population of 4,000 it was estimated that not more than 500 survived, the greater part having perished by their own hands. When the Mantchoos conquered China, they imposed upon the conquered people a portion of their dress and many of their usages. The mode of arranging the hair in a tail now in use by the Chinese was forced upon them by the Mantchoos, to whom it had long been familiar. On the other hand, they have adopted many of the customs of the Chinese, and Father Huc says, probably with some exaggeration, that you may traverse Manchouria from the great wall to the river Amoor, without being at all aware that you are not in a province of China. The Mantchoos began to be conspicuous in eastern Asia about the beginning of the 17th century, when after a long series of internal wars their tribes were united into one nation under a chieftain named Tien-ming, who in 1618 declared war against China, then ruled by the Ming dynasty. He overran and devastated the N. E. provinces, but died in 1627, leaving the prosecution of his design of conquest to his son Tien-tsung, who made alliances with rebels whose leaders pretended to be rightful heirs to the throne. With their aid he made himself master of Peking, and the last of the Chinese emperors, Hwai-tsung, having committed suicide in 1643, the Mantchoo chief took possession of the government. He died in 1644, and his son and successor Shunchi is regarded as the first emperor of the Mantchoo dynasty which still holds the throne.

MANTEGNA, ANDREA, an Italian painter, born near Padua in 1430 or 1431, died at Mantua in 1506. Of his early history little is known beyond the fact that he was by occupation a shepherd boy, who, having found his way to Padua, was placed under the instruction of Francesco Squarcione. His earlier works necessarily reflect the character of the antique sculpture which he studied in the famous school of that master, resembling colored bass-reliefs rather than paintings; and in his first large picture, representing the 4 evangelists, he gave to these sacred personages the aspect of heathen philosophers. About the middle of the 15th century Jacopo Bellini visited Padua, and the conversation and example of this great painter, whose daughter, Nicolasa, Mantegna married, caused him to abate somewhat his predilection for the antique, although he was never able wholly to free himself from its influence. His frescoes in the church Degli Eremitani in Padua, representing the life of St. James and the

legend of St. Christopher, gave the first evidence of his capacity to rise above the cold mannerism of his school and clothe art in the garb of living reality. Rising in reputation in his own city, he was invited about 1468 by Ludovico Gonzaga to Mantua, where, in the service of that munificent patron of art and of his successors, he passed the remainder of his life. During the last 30 years of the century, in which his talents witnessed their highest development, he exercised a sort of patriarchal authority over the painters of northern Italy, sharing with his relatives, the Bellini of Venice, the supremacy in their art, and educating numerous pupils. Between 1485 and 1490 he visited Rome at the invitation of Innocent VIII., and painted with almost miniature-like delicacy a series of frescoes in a chapel in the Belvedere, all of which however perished when Pius VI. destroyed the chapel toward the close of the last century to make room for his new museum. Of his works extant, the principal is the celebrated series representing in 9 compartments the triumph of Julius Cæsar after his conquest of Gaul, originally painted for Ludovico Gonzaga, and which upon the downfall of that family were purchased by Charles I. of England. They were sold by parliament with the rest of Charles's pictures, but were repurchased on the return of Charles II., and now hang in Hampton Court. They are painted in distemper on twilled linen, and even in their present faded and dilapidated condition excite the admiration of the beholder by their grand and spirited composition and thorough reflection of the spirit of antique art, the combination of the sculptural style with the aims and beauties of painting being here singularly appropriate. A picture in chiaroscuro, very similar in character and treatment to this, representing the triumph of Scipio, is now in the possession of Mr. Vivian of London. Of his easel pictures the most famous is the *Madonna della Vittoria*, now in the Louvre, painted in commemoration of the victory gained by Gonzaga over Charles VIII. of France in 1495. In composition and color it represents the maturity of Mantegna's powers. Many other pictures by him are to be found in Italy and the large galleries of central Europe, unequal in merit and having more or less of the hardness and meagreness of which he was never able to divest himself, but all displaying unmistakably the hand of a great master. Mantegna also, according to Lanzi, engraved upward of 50 of his own designs, of which about 80 are known to collectors. Among his plates are his own designs for several of the compartments of the "Triumph of Julius Cæsar."

MANTELL, GIDEON ALGERNON, an English geologist and palæontologist, born in Lewes, Sussex, in 1790, died in London, Nov. 10, 1852. He was educated as a surgeon, and embarked in a lucrative practice in his native town. Inclination, however, led him to devote much time to geological researches, and in a few years his discoveries in the wealden formation, the

extraordinary fossiliferous richness of which had been previously little known, gave him a high rank among living palaeontologists. To his labors science is indebted for the discovery of 4 out of 5 of the genera of extinct dinosaurian reptiles, viz.: the *iguanodon*, the *hylaeosaurus*, the *pelorosaurus*, and the *regnosaurus*; and his valuable museum collected from the wealden and chalk formations, and which was purchased by the trustees of the British museum, contains well preserved fossils of these, and also of many extinct fishes, insects, and plants. In 1825 he was elected a member of the royal society; in 1835 he received the Wollaston medal of the geological society, and in 1849 the royal medal of the royal society. The latter part of his life was passed in London, where he continued his medical practice and geological researches. He was remarkably successful as a lecturer in exciting an interest in scientific pursuits. His chief scientific work separately published is "Fossils of the South Downs, or Illustrations of the Geology of Sussex" (4to., London, 1822). He is also the author of two popular treatises of great merit, "The Wonders of Geology" (2 vols. 8vo., London, 1838), and "The Medals of Creation, or First Lessons in Geology" (2 vols. 8vo., 1844), both of which have been translated into German, and of a number of lesser works illustrating the geology of the British isles and his own discoveries. In Agassiz and Strickland's *Bibliotheca Zoologica et Geologica*, 67 works and memoirs by Dr. Mantell are cited, beside which he wrote several papers on antiquarian and professional subjects.

MANTEUFFEL, OTTO THEODOR VON, baron, a Prussian statesman, born at Lübben, in the province of Brandenburg, Feb. 3, 1805, of a family which ranks among the lesser nobility of Prussia. He lost his father at the age of 7, but was with his brother educated by an uncle, and completed his studies at Halle, applying himself particularly to jurisprudence and political economy. On leaving the university he took up his residence in Berlin, and was in 1829 attached to the department of finance, and afterward filled important political and judicial offices, in which he displayed so much ability that he was regularly chosen as the representative of Brandenburg at the provincial diet. In 1844 he was attached to the prince of Prussia with the title of privy councillor, and entered the council of state. In 1845 he was placed in the direction of the first, and in 1846 of both the first and second divisions of the ministry of the interior. In 1847, on the convocation of the first united diet of Prussia, he was among the most strenuous opponents of a more liberal policy. On Nov. 8, 1848, he was appointed minister of the interior under Count Brandenburg; and when some kind of order was restored by that military man, he contrived, by an exhibition of administrative ability and a profession of free trade principles, to ingratiate himself to some extent with a large party among the middle and commercial classes. After the

death of Count Brandenburg, Nov. 6, 1850, he became minister of foreign affairs, and took an important part at the conference of Olmütz, Nov. 28 and 29, where, by immediately yielding to Austria on all questions of German policy, he brought about a peaceable solution of the complications between the two governments. On Dec. 19, 1850, he was appointed prime minister, and at the same time retained the department of foreign affairs. On Jan. 12, 1852, he became president of the council of state. His name has been intimately associated with the Russian and ultra-conservative policy of the court of Berlin; he enjoyed the confidence of the king, but was not popular. In 1856 he attended the peace congress at Paris as Prussian plenipotentiary. In 1858, after the establishment of the regency of the prince of Prussia, he was succeeded by Baron Schleinitz in the ministry of foreign affairs (Nov. 6), and by the prince of Hohenzollern-Sigmaringen as president of the ministry and of the council of state.

MANTINEA, one of the oldest and most powerful towns of Arcadia, on the borders of Argolis and the river Ophis. Its democratic political constitution was, according to Polybius, one of the best in antiquity. Like the other Arcadian towns, it acknowledged the Spartan supremacy prior to and during the Persian war. It was an ally of Sparta in the early part of the Peloponnesian war, but in 421 B. C. formed a confederacy with Argos, Elis, and Athens, which was defeated and dissolved by the Lacedæmonians in 418. Though it became again an ally of Sparta, its increasing power rendered it obnoxious to the latter city, and in 385 the Spartans attacked and destroyed it by turning the waters of the Ophis against its walls. The Mantineans rebuilt their city after the overthrow of the Spartan supremacy by the battle of Leuctra in 371. They were prominent in the formation of the Arcadian confederacy, but soon abandoned it for an alliance with their ancient enemies the Spartans. To prevent this coalition Epaminondas marched into the Peloponnesus, and Mantinea is chiefly celebrated as the scene of the great battle (362) between the Thebans and Spartans, in which he fell. It continued one of the most important towns of Arcadia till the time of the Achaean league, which it at first joined, but subsequently deserted for the Ætolian confederacy, an event which occasioned the Cleomenic war. In 226 it was surprised by Aratus, and in 222 it was plundered by Antigonus Doson, and its name changed to Antigonea, which it bore till its ancient appellation was restored by the emperor Hadrian. Its ruins are visible at the modern village of Paleopoli.

MANTUA (It. *Mantova*), a province in northern Italy, now forming part of the Sardinian possessions in Lombardy, watered by the Po and its affluents the Mincio and Oglio, bounded N. by Brescia and the lake of Garda, E. by Verona and Rovigo, S. by Modena and Parma, and W. by Brescia and Cremona; area, 900 sq. m.; pop. nearly 800,000. It is celebrated for

its beautiful scenery and for its fertility. The principal products are grain, flax, hemp, rice, fruit, and wine. Under the Romans it enjoyed a high degree of prosperity. After the downfall of the Roman empire it came into the possession of the Visigoths, and afterward of the Lombards. Under Charlemagne it formed part of the Frankish, and under Otto the Great of the German empire. Subsequently the princes of the Este family and the countess Matilda of Tuscany received it as an imperial fief; and at a later period it was under the rule of the princely families of Mantua, among whom the house of Bonacorsi was the most powerful for about 40 years, until the house of Gonzaga rose to eminence, Ludovico Gonzaga assuming sovereignty in 1533. This family, under whom Mantua became a duchy, contributed greatly to the improvement of art and letters and to the embellishment of the capital. The last duke of Mantua, Charles IV., received a French garrison into Mantua, and fought on the side of France during the war of the Spanish succession. On this account he was put under the ban of the empire by Joseph I. (1705); he died without issue in Padua in 1708, and Austria remained in possession of the territory of Mantua. In 1797 it became part of the Cisalpine and afterward of the Italian republic, and in 1805 of the kingdom of Italy; but it was reunited to Austria in 1814, and belonged to the province of Lombardy, in the Lombardo-Venetian kingdom, until July 11, 1859, when by the treaty of Villafranca the province of Mantua with the rest of Lombardy was ceded by the emperor of Austria to the emperor of the French, to be by him transferred to the king of Sardinia. This cession, however, did not include the fortified city of Mantua and its environs.—MANTUA, formerly the capital of the above province, and still continuing in the possession of Austria, about 80 m. S. E. from Milan and 18 m. by railway S. by W. from Verona, is situated on an island in the middle of a lagoon formed by the Mincio; pop. about 81,000. The swamps and marshes surrounding Mantua are injurious to the salubrity of the city; but, in connection with the formidable works which guard all its approaches and enclose it on every side, they constitute its most important defences, and have made it so strong that it is deemed the bulwark of Italy, and impregnable by any means but famine. The communication between the island and the mainland is maintained by several bridges, the longest of which, the Ponte di San Giorgio, forms the principal approach to the city. The latter is entered by 5 gates, one of which, the Porta Mulina, presents a curious specimen of ancient engineering. Mantua has a desolate appearance, except in some of the central parts, where there is commercial activity. It contains however many fine streets, the Via Larga being the widest avenue. Among the finest squares are the Piazza di Virgilio, surrounded by elegant houses; the Piazza delle Erbe, where the market is held; the esplanade or Piazza di San

Petro; the Piazza del Argine, with a marble pillar crowned by a bust of Virgil, and the square where in 1810 the Tyrolean patriot Andreas Hofer was shot by order of Napoleon. Great masses of buildings, consisting of feudal castles with their battlemented turrets and Lombard arches, extend from the Porta di San Giorgio to the Piazza Delpurgo, and include the ancient palatial castle (*castello de Corte*) of the Gonzagas, now used partly as a prison and partly for public offices. Adjoining it is the immense structure begun at the opening of the 14th century, now comprising the so called Palazzo Imperiale, Palazzo Vecchio, and Corte Imperiale, containing about 500 apartments, and mainly indebted for its present beauty to the genius of Giulio Romano, whose works as a painter and architect form the greatest artistic glory of the city, but are nowhere displayed to greater advantage than in the decorations of this palace. The Palazzo del Te, outside of the city, originally intended for ducal stables, also grew up under the genius of Romano to the dimensions of a vast and magnificent building. The principal churches are the cathedral, San Andrea, and Sta. Barbara, all more or less rich in paintings, particularly the last, which also contains in its sacristy a golden vase attributed to Benvenuto Cellini. San Maurizio contains the "Martyrdom of the Saint," one of the finest works of Ludovico Carracci. The shambles (*beccheria*) and fish markets (*peschiera*) were planned and built by Giulio Romano. Mantua is a bishop's see, and contains a number of educational and charitable institutions, a botanic garden, a museum of antiquities, a library of about 80,000 volumes, an academy of science and fine arts (*Virgiliana*), now chiefly used as a school of drawing, a chamber of commerce and industry, a *monte di pietà*, a general house of correction, a military arsenal, a theatre, and an elegant amphitheatre. The manufactures are limited, and the principal article of trade is silk. The principal dealers are the Jews, who still live in a separate quarter (*ghetto*).—Mantua is supposed to have been founded by the Etruscans long before the building of Rome. It derives its chief classical celebrity from associations with Virgil, who has celebrated Mantua, as the place of his birth, in several passages of his works. Charlemagne gave it its first fortifications, which in modern times were completed in their present form by the Austrians. In the middle ages Mantua was one of the most important cities in Italy. In 1630 it was seized by the imperialists and subjected to terrible calamities, from which the city has never recovered. In 1796 Gen. Bonaparte, hopeless of reducing the fortress, kept it under strict blockade till famine compelled it to capitulate. In July, 1842, the Jews, who number about $\frac{1}{10}$ of the population, were subjected to great persecutions. In the war of Piedmont with Austria in 1848, the victory depended on the possession of Mantua; it was blockaded for several months by the troops of Charles Albert, who was finally

defeated by Marshal Radetzky in the battle of Custoza (July 25). During the war of 1859 Mantua was again of high strategical importance, as one of the most formidable strongholds of Austria, and, together with the neighboring fortresses of Peschiera, Verona, and Legnago, saved her from being entirely stripped of her possessions in Italy.

MANU. See BRAHMA.

MANUEL I. COMNENUS, a Byzantine emperor, born about 1120, succeeded his father, Joannes II., in 1143, died in 1180. The valor which he had displayed against the Turks induced his father to bequeath the crown to him rather than to his elder brother Isaac, who was immediately imprisoned by Axuch, the minister of the deceased emperor. Returning from his campaign in Cilicia, Manuel was received with enthusiasm at Constantinople, but was at once involved in wars both in the East and the West, which lasted with brief intermissions through his reign. In 1144 he subjected Raymond, the rebellious Latin prince of Antioch. In 1145 he defeated the sultan of Iconium in successive pitched battles. In 1147 he promised his aid to the new crusade headed by Louis VII. of France and Conrad III. of Germany, and though he allowed them a passage through his dominions he gave secret information to the Turks. In 1148 he began the most important war of his reign with Roger, the Norman king of Sicily, who had taken Corfu and prepared to invade Greece. He formed an alliance with the Venetians, who within a year joined him before the fortress of Corfu, which was surrendered after an obstinate siege. He was prevented from invading Sicily by hostilities of the Serbians and Hungarians, instigated by Roger, the former of whom were vanquished in two campaigns, but the latter protracted the war till 1152. In that year he suffered a reverse from the Turks in Cilicia, but his general John Ducas gained so great successes in southern Italy that Manuel conceived the project of reuniting the eastern and western empires. The defeat of Alexia, the successor of John Ducas, by William, the successor of Roger, soon followed; the Sicilian admiral Maius routed the Greek fleet off Negropont, and advanced toward Constantinople; and Manuel therefore accepted an honorable peace in 1155. Those Greek prisoners who were silk weavers were retained in Italy, and gave origin to the flourishing Italian silk manufactures. In the following years he waged successful wars with Raymond, prince of Antioch, and Az-ed-din, the Turkish sultan. A new war soon broke out with Gejza, king of Hungary, which was terminated by a disastrous defeat of the Hungarians near the present Semlin. In 1176 he experienced a terrible defeat from Az-ed-din in the mountains of Pisidia, and was obliged to sign a disadvantageous peace. By breaking the treaty and renewing the war he obtained honorable terms. Depressed by this disastrous expedition, he never recovered his former military enterprise and ambition. The

heavy war taxes levied from his subjects during his reign were often employed in pensioning ministers and men of influence at foreign courts, while his troops went unpaid. II. PALAEOLOGUS, a Byzantine emperor, born in 1343, succeeded his father Joannes V. in 1391, died in 1425. At the death of his father he fled from the court of the sultan Bajazet, with whom he had been left as a hostage. The consequence was a war with Bajazet, in which Manuel was supported by an army of Hungarians, Germans, and French. The allies, under the command of Sigismund, king of Hungary and afterward emperor of Germany, were defeated at Nicopolis in 1396, with the loss of 10,000 men. Constantinople was besieged, and its fall seemed impending, when the conquests of Tamerlane diverted the arms of the sultan. Manuel visited Italy, France, and Germany, vainly seeking assistance from the western princes. In the conflict between the Tartars and the Turks, he acted with diplomatic skill, and secured peace to his empire. He sent ambassadors to the council of Constance with instructions to urge a union of the Latin and Greek churches; but his real object was only to obtain aid from the kingdoms of the West, and to alarm the Turks by the negotiations.

MANUMISSION, in Roman antiquity, the form by which slaves, or other persons not *enajuris*, were released from their condition. There were 3 modes of effecting a legal release, by *vindicta*, census, or will. The former was the oldest, and as follows: The owner brought his slave before the magistrate, and stated the grounds on which he intended his manumission. The lictor laid a rod on the head of the slave, and declared him free by right of the Quirites; the master, who in the mean time held the slave, pronouncing the words: "I wish this man to be free," turned him round, and let him go (*emit e manu*, whence the term). The magistrate then declared him to be free. The manumission by census was effected by the slaves giving in their names at the lustral census at the bidding of their masters. By will a slave could be made free conditionally or unconditionally, or free and an heir to the testator. There were various restrictions on manumission enacted by laws at various periods. The act of manumission established the relation of patron and freedman between the manumittor and the manumitted; and if the former was a citizen the latter became a member of his *gens*, and assumed his family as well as personal name, to which he added some other as surname, commonly that by which he was previously known.

MANURES. See AGRICULTURAL CHEMISTRY, vol. i. p. 215.

MANUSCRIPT (Lat. *manu scriptum*, written with the hand), in bibliography, a written book or paper in distinction from printed matter. Prior to the invention of printing all literature was contained in manuscripts. Monumental writing, which covers the walls of ancient Egyptian and Assyrian edifices, preceded the general use of

paper made from the Egyptian papyrus. Plates of lead, tablets of wax, palm leaves in India, and parchment made from skin were all known, but were less in use than the papyrus during the period from the conquests of Alexander to those of the Saracens. In the 7th and 8th centuries the changes which had occurred in the East rendered the exportation of papyrus difficult, and it became rare in western Europe. The monasteries therefore were obliged to employ parchment, which on account of its greater cost had been previously used only for copies of special elegance. Its expense, too, caused transcribers to efface the pagan writing on ancient parchment, in order to employ it again for antiphonaries, missals, legends, and monastic records. This custom of palimpsest writing continued till the 14th century. About the 10th century paper made from cotton was invented at Byzantium and introduced into the West. The manufacture of paper from rags, one or two centuries later, first furnished a material for writing as cheap and convenient as the ancient papyrus.—The Greeks and Romans committed the care of transcribing principally to slaves, called by the latter *servi literati*, who were esteemed of great value when they excelled in the art. There were also at Rome professional copyists, some of whom were women. When in 281 Origen undertook the revision of the Old Testament, St. Ambrose sent to his assistance a number of deacons and virgins skilful in calligraphy. In the middle ages copying was almost exclusively in the hands of ecclesiastics, who were called clerks (*clerici*). The *scriptorium* of monasteries was exclusively devoted to this purpose. The Benedictines especially excelled in the care with which they copied and preserved manuscripts.—No parchment manuscript extant is believed to be of an earlier date than the 8d century. Few of the millions of volumes in ancient Italy and Greece survived the devastations of the northern barbarians, the papyrus having been far less firm and durable than modern paper, and parchment having been rarely employed. Five parchment pagan manuscripts, four in Latin and one in Greek, are ascribed to the 4th or 5th century. About as many Christian manuscripts are of the same age. Of the former, two are copies of the works of Virgil, one of which is in the Vatican and the other in the Medicean library at Florence, both adorned with illuminations of various colors. The third is a Roman calendar of about A. D. 354, adorned with illuminations for the 12 months. The fourth is the tablet of Peutinger, described by Bergier and Mannert. The Greek manuscript is a copy of Dioscorides, described by Lambecius, abounding in illuminations, some of which are probably of later date. In 1825 a fragment of the Iliad, written in capitals on papyrus, was found in the island of Elephantine, in Upper Egypt, which some esteem the oldest of all classical books. Among the Christian manuscripts of the 4th or 5th century is the Gospel of St. Mark, on papyrus, at Venice; the Bible

of Ulfilas, in Sweden; and the so called Alexandrian manuscript, written in capitals on vellum, and now in the British museum. It was copied, according to its prolegomena, by Thecla, an Egyptian lady, was in the possession of the patriarch of Constantinople in 1098, was there presented to the ambassador of Charles I. of England, and was published by Dr. Woide and the Rev. H. H. Baber (London, 1786–1828). The ornaments and illuminations are the most curious features of mediæval manuscripts. The initial letters and words of chapters and other principal divisions assumed most diverse and fantastic forms. They often covered a whole page, representing men, animals, plants, and fruits with grotesque deformities. Gothic illustrations, vignettes, and colored or gilded initial designs were so common that it was charged that *hodie scriptores non sunt scriptores, sed pictores*. Letters of silver or gold were introduced, and many words were colored purple, red, or violet. The parchment prepared for the most precious, especially for sacred books, was often colored blue, and the writing was in gold or silver.—In examining a manuscript, the points to be chiefly considered are: its antiquity; the distinction between the different styles of writing prevalent in different countries and times, of the greatest value in determining the age of manuscripts older than the 18th century; the miniatures, vignettes, and arabesques which accompany it; the metallic and other liquors used; the covering, the material and ornamentation of which is often interesting both to the antiquary and the artist; the character of the contents; and the beauty of the execution. Among the signs for determining their antiquity are the following: in the manuscripts previous to the 8th century there is no space left between the words, so that the lines are entire, presenting an uninterrupted series of letters; the period or dot is unusual, and when employed is placed above the letter and not in the line; before punctuation was introduced, a slight space was left between complete clauses; commas did not come into use till the close of the 10th century; the interrogation and exclamation points and the parentheses were not employed till the 15th century; abbreviations are rare prior to the 8th century, but were so common subsequently as to render many manuscripts almost unintelligible, and they abound in the earliest specimens of printing. The presence or absence of the Greek accents decides nothing as to antiquity. Most manuscripts bear no chronological mark, and their age must therefore be determined by other indications, especially by the mode of writing. Those written entirely in capitals are not later than the 8th century; those entirely in uncials are more modern in proportion as the titles of chapters and the initials are more highly adorned. The cursive Roman style became the Lombardic and Merovingian in the 6th century, and inclined in the 10th toward the Gothic. The repetition at

the foot of every page of the first word on the following page belongs to the 12th and subsequent centuries. The Arabian numerals first appear in writing near the beginning of the 12th century.—In form, manuscripts are either rolls (*volumina*) or consist of bound pages like printed books (*codices*). The page is usually quarto, rarely folio or octavo. They constitute the most valuable portion of many modern libraries, the original autographs of mediæval and modern works being in many cases preserved. Their collation is of the highest authority in determining disputed texts. The science of reading and judging concerning ancient manuscripts and documents is called *diplomata*, and is a branch of *paleography*. The principal collections of manuscripts in European libraries have been catalogued and described.—See Montfaucon, *Bibliotheca Bibliothecarum Manuscriptorum Nova* (2 vols., Paris, 1789); Ebert, *Handschriftenkunde* (2 vols., Leipzig, 1825-'7); and *Paleographie universelle*, with facsimiles by J. B. Silvestre, and descriptions by Champollion-Figeac and Aimé Champollion (Paris, 1840).

MANUTIUS (MANUZIO). I. **ALDUS**, called the Elder, the first of a well known family of Italian printers, born in Bassiano, Papal States, about 1449, died in Venice in 1515. He was deeply versed in classical literature, and about 1490 established a printing press in Venice, which soon became celebrated for the variety and excellence of the works issuing from it. In 1594 appeared his edition in Latin and Greek of the "Hero and Leander" of Musæus, followed within a few years by editions of Plato, Aristotle, Herodotus, Pindar, the Greek dramatists, &c., many of which were printed from original manuscripts procured from distant countries at considerable expense. His Latin editions, published subsequent to 1500, and commencing with Virgil, are printed in a character cast, it is said, in imitation of the handwriting of Petrarch, and now called *Italic*; and the editorial labors of the publisher were shared by a society of learned men who met at his house and formed what was called the Aldine academy. These impressions are said to be more correctly printed than the Greek. In 1506-'7 he suffered by the wars in which Venice was engaged, but subsequently pursued his avocation with industry and success until his death. Beside the numerous prefaces and dissertations in Greek and Latin embodied in his publications, he produced grammars of the Greek and Latin languages, a Greek-Latin dictionary, translations, &c. The title pages of his books have a device representing a dolphin coiled about the shank of an anchor, on either side of which are the syllables *Al* and *Dvs*. II. **PAULUS**, youngest son of the preceding, born in Venice in 1512, died April 6, 1574. He was a man of equal learning and critical ability with his father, and was distinguished by the correctness of his editions of the Latin classics, particularly of his Cicero, with prefaces, notes, and an index. Failing to receive adequate patronage in Venice, he repaired about

1562 to Rome, and was for some time employed in editing and printing the manuscripts of the church fathers deposited in the capitol. He returned to Venice in 1570, but died in Rome in poverty. He published a Latin translation of the Philippics of Demosthenes, and a number of original works in Latin and Italian, which entitle him to rank among the most polished writers of the 16th century. III. **ALDUS**, called the Younger, son of the preceding, born in Venice in 1547, died in Rome in 1597. He published at the age of 11 a collection of choice specimens from Latin and Italian authors, and 8 years later produced a treatise on Latin orthography, *Orthographia Ratio*, founded on inscriptions, medals, and manuscripts. Notwithstanding these evidences of precocity, his mental capacity and attainments were inferior to those of his father or grandfather; and in consequence of his neglect to employ competent persons to superintend his publications, they are the least valuable of all emanating from the Aldine press. He resigned his press in 1584 to one of his workmen, and during the remainder of his life was professor of belles-lettres successively in Bologna, Pisa, and Rome. He published a number of works in Latin and Italian, beside commentaries on Horace, Cicero, &c.—A complete list of the publications of the Aldi may be found in Rénouard's *Annales de l'imprimerie des Aldes* (8d ed., 8vo., Paris, 1834). (See **ALDINE EDITIONS**.)

MANZONI, ALESSANDRO, count, an Italian poet and novelist, born in Milan in 1784. His father possessed little cultivation; his mother was a daughter of the distinguished philosophical economist Beccaria. As a child he came under his grandfather's influence, and became familiar with the reigning French ideas. He studied with excellent success, first at Milan and afterward at Pavia, where he was an enthusiast for Alfieri, Monti, and Foscolo. In 1805 he went with his mother to Paris, and was received into the society of Auteuil, then including Volney, Cabanis, Garat, De Tracy, and Faurel, with the last of whom he became particularly intimate. The sudden death of a friend furnished the subject of his first poem, in blank verse, entitled *In morte di Carlo Imbonati* (Paris, 1806). Returning to Milan in 1807, he married in the following year the daughter of a banker of Geneva, and published in 1809 his mythological poem *Urania*. His education and residence in Paris had led him to imbibe infidel opinions, and his wife belonged to the Calvinistic church; but both now became devout Roman Catholics. The change was announced by his *Inni sacri* (Milan, 1810), a collection of lyrics on the nativity, the passion, the resurrection, pentecost, and the assumption, marked by fervent and elevated piety. The romantic school of Germany, inspired especially by the Schlegels, which sought the materials of literature in mediæval sources, was now exerting an influence in Italy as well as France. Manzoni was one of those who sought to revive the na-

tional literature by renouncing classical subjects and laws, and by adopting the spirit, intensity, and irregularity of mediæval romance. In 1820 appeared his romantic drama *Il conte di Carmagnola*, dedicated to Fauriel, which violated the unities of time and place, but was remarkable for its simplicity of plot and purity of style. It attracted attention throughout Europe, was severely criticized, was admired by Goethe, and was defended by the author in a letter written in French *Sur l'unité de temps et de lieu*. It was followed in 1823 by another tragedy, *Adelchi*, which has more striking dramatic effects, and is especially admired for the lyrical choruses introduced into it in the manner of the Greek drama. Meantime, on occasion of the death of Napoleon, he published an ode, *Il cinque Maggio* (1821), one of the finest modern Italian lyrics, in which, to the surprise of his Catholic and royalist friends, he highly exalted the emperor. His greatest success was achieved by the novel *I promessi sposi* (3 vols., Milan, 1827), a Milanese story of the 17th century, which was translated into the principal languages of Europe. It is a touching delineation of village and rustic life, all the characters in which are original, are clearly and vigorously conceived, and have remained popular. It exhibits in different portions a remarkable variety of style. In an illustrated edition (Milan, 1842), he added to the original text a *Storia della colonna infame*, in which he gives an account of the executions caused by the popular superstition during the plague of 1630, and touches upon some of the highest questions of social economy. It was believed that the disease was propagated by persons who anointed the walls of houses with a fatal poison, and many of these *untori* were tortured and executed with horrible cruelty. In 1834 he wrote *Osservazioni sulla morale cattolica*, in reply to Sismondi's depreciation of the moral influence of the Catholic church in the middle ages; it was translated into English (London, 1836). After the success of *I promessi sposi* Manzoni almost renounced profane literature to gratify his taste for domestic life and pious contemplation. He has lived for about 80 years in retirement, mindful neither of his own fame nor of public interests, and cherishing only inward peace and the practice of virtue. He married a second time in 1833, and has been afflicted by the death of all his children, the last dying in 1856. He resides at Brusano, near Milan. Whether as a lyrical poet, a tragic dramatist, or a novelist, he has exercised less influence upon any department of literature than upon the Italian language, to which he has contributed to give ease, variety, and unity. His *Promessi sposi* has been translated in England, and republished in America, under the title of "The Betrothed Lovers."

MAP (Lat. *mappa*), a representation of a portion of the earth's surface, or of the celestial sphere, upon a plane. Its object is to present to the eye the bearings of objects upon the surface from each other, and their relative dis-

tances apart, as nearly correct as may be. But this can be done with accuracy only upon a globe, the surface of which is similar to that of the earth itself. Various plans, however, have been devised by which in the more convenient form of plane sheets true delineations of the surface are presented, reference being had to the principles upon which these maps are constructed. By the method called projection, the rules of perspective are applied to the delineation of objects upon the surface according to four principal modes. In the method of projection called orthographic, the eye is supposed to be at an infinite distance from the sphere, so that the rays of light coming from every point of the hemisphere opposite to it may be considered as parallel to one another. The sphere is intersected through its centre by a plane perpendicular to these rays, and it is upon this plane that the objects are projected, as their shadows might be cast upon it from the sun through a transparent medium. Objects near the centre of the plane would by this method be delineated in nearly correct proportions; but in receding from this, as the rays strike more obliquely upon the surface of the sphere, their projection becomes more and more distorted, and the parallels of latitude or meridians of longitude (as the eye is placed opposite the pole or the equator) are drawn more and more closely together.—In the stereographic projection, the eye is supposed to be placed at the surface of the sphere, and the surface to be delineated is the opposite hemisphere or a portion of it, of which the inner or concave side is presented to the eye. The plane upon which the objects are projected is supposed to be transparent, and placed so as to pass through the centre of the earth, its surface perpendicular to the line passing from the eye to the centre. In this method the meridians and parallels intersect each other as they do upon the globe; and though there is distortion increasing from the centre, it is less than by some of the other methods. The stereographic method is much used for the maps of the world drawn in two hemispheres; and the meridian of 20° W. from Greenwich is usually selected for the plane of projection, because this throws the two great continental divisions of the earth into their respective hemispheres.—In the central or gnomonic projection, the eye is supposed to be at the centre of the earth, and the objects upon the surface are projected upon a plane which is a tangent to its surface. This method is obviously applicable to maps of a limited extent only; and except for maps of the polar regions, where the parallels of latitude are concentric circles, and the meridians are straight lines, they are troublesome to execute on account of the irregular curves the parallels assume.—In the globular projection, the eye is supposed to be at a distance from the sphere equal to the sine of 45°; or, the diameter being 200, this distance is 70.7. In order, however, that the meridians may intersect the equator at equal distances, the distance for the eye is generally

fixed at 59½, the diameter being 200.—Maps are also constructed upon the principle called development, which is a mode of projecting the forms upon the surface of the earth upon the inner surface of a cone or of a cylinder, which is supposed to envelope the earth and touch it only around the circle which is to be the middle latitude of the map. The points on the earth's surface being projected by other lines drawn through them from the centre, the inner surface of the cone or cylinder is afterward supposed to be unrolled or developed, and thus present the various objects upon a plane surface. Those situated nearest the middle latitude will be most correctly represented. In the use of the cylinder the latitude circles and meridians appear as parallel straight lines, and thus most correctly represent for nautical purposes the angles at which they are cut by objects moving over the surface on any other lines. This principle is in part the foundation of the projection known as Mercator's, and applied by him to charts for navigators, in which the correct bearings of objects upon the surface are of more importance to determine than the true figures of countries.—Maps are also constructed upon other principles according to the special purposes for which they are designed. In maps of small areas, the figure of the earth may be neglected, and the positions and forms of bodies be represented as if the surface were itself a plane. Some have special objects in view, as the delineation of the coast lines, channels, shoals, reefs, lighthouses, &c., upon what are called hydrographic maps or charts; others are intended to show the political divisions of states, counties, and towns; and others to represent the natural features of a country, as its mountains, hills, rivers, plains, &c.; for all of which certain conventional signs are adopted. Maps of this character are designated topographical. Maps have also been constructed to represent the courses of the winds and of oceanic currents over the surface of the earth; to designate the position of the isothermal lines; to indicate the geological formations found in different regions; and others to indicate the flora and the fauna of different countries. In the construction of geographical maps covering large areas, the principal places are located according to their latitudes and longitudes, and the lines of coasts and of countries, roads, &c., are plotted from the most exact surveys that have been made. Those which have been conducted under government patronage have furnished the materials for the best maps, and these are constantly improving as new materials are collected. Of the United States, the most complete maps are those of the state of Massachusetts made by order of the legislature, and of the coast survey under the general government. The great lakes, more especially on the Canadian side, have been surveyed and mapped with great accuracy by Lieut. Bayfield of the royal army, whose operations, extended down the St. Lawrence, are still carried on in

the gulf at its mouth. Maps of the Spanish provinces in America have been made by the Spanish hydrographical depot in Madrid; and Brazil and other South American states have executed maps of their territories.—Of the early history of maps little is known. The art of constructing them no doubt commenced with rude delineations, such as people of barbarous nations now present to picture the geography of places with which they are familiar. The ancient Egyptians had some knowledge of maps, as Sesostris caused the territories he possessed and had conquered to be represented upon tablets for the instruction of his people; and the Israelites appear to have acquired the same knowledge, from the record, in Josh. xviii. 6, of a map of the country being ordered by that lawgiver. In the works of the ancient Greeks no allusions are found to maps, though it is believed they had some knowledge of them from the Phœnicians, who made use of them in navigation. The first map of the world, as known to the ancients, is said to have been made by Anaximander the Milesian. Herodotus makes mention of maps constructed by the Persians in the time of Darius, and of one of Aristagoras of Miletus. The progress made by Eratosthenes in determining the true figure of the surface and representing the correct positions of places upon the terrestrial surface is referred to in the article *EAETH*. He introduced the lines of latitude and longitude, and the use of these was established by Hipparchus upon a mathematical principle. Still, for want of exact surveys, and owing to the dependence of geographers upon the reports of travellers and their *itineraria picta*, or painted itineraries, the maps afterward made were extremely inaccurate. Even those of Strabo and Ptolemy, of which the latter for centuries were the chief authorities in geography, contained most extravagant errors, such as giving to the Mediterranean 1,400 miles greater length than belonged to it; and what is still more extraordinary, this exaggeration and others of similar character were continued in all the maps from that period down to the commencement of the 18th century. The system upon which Ptolemy's maps were drawn was that of stereographic projection. After the discovery of America, the early maps representing the position of the new world relative to the old were exceedingly inaccurate. In one published in Venice in 1546 Asia and America are joined together in lat. 88°. The great difficulty was in determining the true longitude of places; and until this could be done there was no means of avoiding such errors. The first step toward this object was made by Galileo in 1610, in applying the eclipses of the satellites of Jupiter to this determination. Cassini greatly perfected this system, and published a set of tables in 1668. In 1700 De Lisle published a new map of the world, and others of Europe, Asia, and Africa, founded on comparatively accurate astronomical observations, and in them the errors introduced from the maps of the an-

clients were first corrected. D'Anville, Picard, and La Hire were also distinguished geographers of this period, and employed by the government of France to correct the map of the country. The true system of map making may be considered as at that time established.—Maps were first engraved on metal by Buckink and Schweynheim in 1478, and on wood by Holl in 1482. An "Essay toward a Circumstantial History of Maps," by Hauber, was published in Ulm in 1724. A historical account of the art is also given in a series of lectures by Mr. J. G. Kohl, published in the annual report of the Smithsonian institution for 1856-'7. See also Santaran, *Essai sur la cartographie pendant le moyen âge* (8 vols., Paris, 1849-'53).

MAPES, or MAP, WALTER, an English scholar and Latin poet, born about the middle of the 12th century, probably in Herefordshire, died about the beginning of the 18th. He studied in Paris, and after his return became a great favorite on account of his learning and courtly manners, especially with Henry II., by whom he was sent on a mission to the French court, and to the council summoned by Pope Alexander III., at which he was called on to refute the deputies of the Waldenses. He received several livings, was made canon of the cathedrals of St. Paul and of Salisbury, and finally became precentor of Lincoln and archdeacon of Oxford. His tastes were however for elegant literature, and he is only known at the present day as a genial, festive, and satirical writer, to whom is attributed a great portion of the humorous rhyming Latin Leonine lyrics and Norman French romances of the latter half of the 12th century. Of late years it has been doubted whether Mapes was really the author of the poems which pass under his name, but the fact that they were for several centuries so generally attributed to him has been thought to prove that he excelled in a peculiar style of writing, and that a part of them at least are his. He also wrote much prose both in Latin and Anglo-Norman. Among the former is his *De Nugis Curialium*, a work containing much curious information of a very varied character; and among the latter are a large portion of the existing romances of the round table. For a translation of Mapes's most celebrated lyric, *Mihi est propositum*, see BACCHANALIAN SONGS. The "Latin Poems commonly attributed to Walter Mapes" were printed in London by the Camden society in 1841, and the work *De Nugis Curialium* in 1850.

MAPLE, a genus of trees of the natural order *acerinea*, with rather inconspicuous flowers, which either have stamens only or pistils only, or both united in the same flower; leaves in all cases simple; fruit double, each division containing a one-seeded cavity and extended into a kind of wing called the key or *samara*. In the "Penny Cyclopædia" 84 species are given as natives of various parts of the world; and London in his *Arboretum Britannicum* mentions 19 species as sufficiently hardy for experimen-

tal planting in Great Britain. Ten species are enumerated by Torrey and Gray in the "Flora of North America" as belonging to the United States. Several of the most valuable kinds are indigenous to New England, while others are found ranging from Canada to the Rocky mountains, and southward to Carolina and Florida. Many of the European species seem well suited to the northern states, and flourish under cultivation. Thus the sycamore maple (*acer pseudo-platanus*, Linn.) is a noble tree, which grows to great perfection in Italy, acquiring a height of 60 feet. According to Emerson ("Report on the Trees of Massachusetts"), it is remarkable for its rapid growth in this country, sometimes attaining a height of 100 feet. The Norway maple (*A. platanoides*, Linn.) belongs to the north of Europe, but grows as readily here as our native species. It is a fine tree, with very handsome, glossy, deep green leaves. Its wood is valuable for turners' work, and its sap is saccharine. There are two varieties much prized by gardeners, the one called silver-striped and the other cut-leaved, having a jagged and deeply incised foliage. The common European maple (*A. campestre*, Linn.) is in England scarcely more than a bush or small tree of inelegant appearance, and its wood is of little value; but in the southern regions of the Caucasus, as we are assured by Pallas, it is a handsome tree, its wood being hard and valuable for various manufacturing purposes. A small tree of similar appearance is the Montpellier maple (*A. Monspessulanum*, Linn.), growing naturally in dry, stony situations in France. The Tartarian maple (*A. Tataricum*, Linn.) is an ornamental tree 20 feet in height, indigenous to the southern provinces of Russia in Asia, and called by the Calmucks *sorra-modon* or locust tree; they prepare an astringent beverage from its fruit, which when mixed with an abundance of milk and butter forms a favorite article of diet. In Thunberg's *Flora Japonica* are 6 species given as indigenous to Japan. A small evergreen species is known as the Candian maple (*A. Croticum*, Linn.), having flowers in erect clusters, and leathery, glossy, smooth, 8-lobed leaves; it is found growing wild on the mountains of the Grecian archipelago, and is thought to be very handsome. A similar but smaller species, sometimes seen in European collections, is the variable maple (*A. heterophyllum*, Willd.), with a very glossy sub-evergreen foliage; it attains a height of only 8 or 10 feet, and is tender and delicate. Under long cultivation from seeds and by a disposition to sport, many singular varieties and variations have been from time to time produced from the maples, of which the most singular is the "eagle's claw," a variety of the Norway maple, seen in our gardens and much prized. Varieties with spotted or variously cut leaves are also well known.—Of the American maples, we may mention in order, following Torrey and Gray, the moose wood or striped maple (*A. Pennsylvanicum*, Linn.), a beautiful little tree, usually growing from 12 to

20 feet high. The stems or trunks become curiously striped in long, longitudinal lines; the branches are of a beautiful green; the buds and young leaves on expanding are of a delicate rose color; the leaves are placed opposite to each other; the flowers are in graceful pendulous racemes; the fruit is in hanging clusters. This species is much admired especially for ornamental planting, and according to Michaux its size may be increased to 4 times its natural proportions by grafting it upon the sycamore maple. Loudon recommends it for the same purpose. Its natural range of growth is between lat. 43° and 45°. The term moose wood is given to it in Maine because there it forms the favorite food of the moose in its winter browsings. The mountain maple (*A. spicatum*, De Lamarck) is a slender, small shrub, from 6 to 10 feet in height. Its leaves are heart-shaped at base, coarsely toothed, downy beneath, divided into 3 to 5 lobes, which end in sharp points; its leaf stalks are very long, and become purple in September. The flowers are borne in many-flowered racemes, and are small and greenish; the fruit is often reddish. This species has nearly the same range as the last. The large-leaved maple (*A. macrophyllum*, Pursh), a native of the N. W. coast, is perhaps the most conspicuous of the American species; it occurs in Oregon, and is common along the alluvial banks of rivers between lat. 40° and 50°. According to Mr. Douglas, it is one of the most graceful of trees in the country it inhabits, varying from 40 to 90 feet in height, and from 6 to 16 feet in the circumference of its trunk. Its leaves, as its name imports, are very large, but variable in size upon the same tree, very deeply 5-lobed; its flowers are rather large, yellow, and fragrant. Its wood is soft, but beautifully veined, resembling, says Nuttall, the curled maple. It was introduced into England in 1812, and propagated from layers. Growing in company with this tree is the round-leaved maple (*A. circinatum*, Pursh), ranging from lat. 43° to 49°. Its trunk rises to the height of 40 feet; its bark is smooth, its wood fine, white, and close-grained, taking a good polish, and presenting a beautiful curled appearance of texture. The smooth maple (*A. glabrum*, Torrey) is a small shrub, occurring in the Rocky mountains about lat. 40°; its leaves are similar to those of the common currant in size and shape; its fruit smooth, with very short, broad, diverging wings. Closely related, and perhaps only a variety, is the 3-parted-leaved maple (*A. tripartitum*, Nutt.), a shrub occurring in the Rocky mountains near the line of Upper California. —The sugar maple (*A. saccharinum*, Linn.), known also as the rock maple, is when young a beautifully shaped tree; but when older it assumes a great variety of forms. Soils seem to affect the style of growth to a remarkable degree. Emerson says that it forms a broad pyramidal top on moist hills and mountain sides; on the plain, in moist, deep, clayey soils, the top assumes the shape of a massive cylindrical col-

umn of great height, often 70 or 80 feet; in the forest it assumes its most remarkable appearances, with various configurations of outline and direction of branches. The foliage of the rock maple consists of strongly heart-shaped, 5-palmately dividing lobes; the leaves are of a bright green and smooth on the upper surfaces, and of a pale glaucous hue beneath; they differ on different trees in intensity of color. Its autumnal tints are brilliant, golden or splendid orange, sometimes bright scarlet or crimson, and they are the first to appear in the landscape. The flowers are yellowish green, pendulous upon thread-like hairy pedicels, one or two inches long. The fruit is also borne upon long pendulous footstalks, which are simple or compound with several pairs of opposite branches. The species extends from lat. 40° N. into Canada, and westward to the Rocky mountains; it is most abundant in the New England states and the country immediately N. and S. of them. The wood of the rock maple is of remarkable beauty and of great variety of appearance; the kind called curled hard maple has sinuous courses of fibres, giving a changeable surface of alternate light and shade; the bird's-eye maple has numerous contortions of its fibres into little knots looking like the eye of a bird. Both these kinds, when polished, are of exquisite appearance. The wood is employed for a great variety of useful purposes, for ornament and durability, and even in naval architecture its timber is ranked next to oak; for fuel it is second only to hickory. It is the species preferred in the making of sugar, its sap containing more crystallizable sugar than the juices of the other maples, or of birches, lindens, hickories, or walnuts. A tree of about 6 feet diameter has been known to yield a barrel of sap in the course of 24 hours; the average run is from 12 to 24 gallons each season. Carefully made and purified, maple sugar is identical in its composition with that of the sugar cane. The rock maple is much employed for ornamental planting upon highways and in streets, not requiring any extra care for success. The black sugar maple (*A. nigrum*, Mx.) is considered by Torrey and Gray as identical with the preceding species. —The white maple (*A. dasycarpum*, Willd.) occurs upon the banks of rivers in Maine and Vermont to the upper and middle parts of Georgia, but most abundantly in the western states. Its trunk is low, but the spread of its branches is so magnificent as to recommend it for an ornamental tree. Its foliage is finely cut, of a deep rich green on the upper surfaces of the leaves and of a silvery white hue beneath; the flowers appear in April before the leaves, and are small and of a pale yellowish purple. The ripened seed vessels (*samarae*) are large, thickened, and have wings 2 or 3 inches long, somewhat downy, but much more so when young. The species was introduced into Great Britain in 1725 by Sir Charles Wager, whence it there bears his name. Lindley says it is extremely common in all the

plantations of Europe, where it is conspicuous for the deep crimson hue of its leaves in autumn. It is called by European nurserymen the cut-leaved scarlet maple; but in the United States it usually bears the name of silver maple or soft maple. We have seen on the banks of the Connecticut river beautiful specimens of this tree, with broad, spreading branches, and a light, thin, graceful foliage, allowing the sunshine to penetrate and to produce flickering shadows upon the ground.—The swamp maple, or the scarlet, the soft maple, the white maple, and the red maple (*A. rubrum*, Linn.) are all one and the same species, as these several names are given to the same tree in different districts. It grows abundantly in swamps, and is widely diffused over the United States. It is usually a rather low tree, of less beauty of shape than the other species. Its trunk, however, sometimes rises to the height of 60 or more feet, and its diameter may be 3 or 4 feet. Its wood is close-grained, and the fibres often curl or have a wavy course, rendering it very ornamental in cabinet work. It is much esteemed for fuel, but its sap affords little sugar. It is seen in its greatest beauty in April or May, when its rich crimson flowers expand; they are small, on short pedicels, which lengthen, however, as the flowering advances. The young twigs are of a bright purple or reddish color and dotted with brown. The leaves are commonly 3 or 4 lobed, and usually heart-shaped at base. In the autumn they assume the richest hues and tints; and sometimes in overflowed swamps the foliage of some one tree is gorgeously colored early in August. The tree is well adapted for shade or ornament, especially in moist soils.—The maples are all easy of cultivation from seeds or from layers. The seeds should be gathered as soon as ripe, and either sown immediately or kept in moist sand during the winter, sowing the next spring. The rarer and more curious sorts can be grafted upon the more common, and thus propagated to advantage. The bark of some of the species is used for producing permanent dyes of brown and yellow; it also contains some astringent principles.

MARABIOS, a range of volcanoes in Nicaragua, extending from Lake Managua N. W. to the bay of Fonseca, consisting of the cones or peaks of Momotombo, Axusco, Santa Clara, Las Pilas, Telica, and El Viejo. These mountains are distinct from each other, and rise sheer from the plain, with level spaces between them. At the time of the Spanish conquest several of them were active, but at present only Momotombo shows signs of life.

MARABOU, the popular name of several large birds of the stork family, of the genus *leptoptilus* (Lesson), natives of Asia and Africa, whose delicate vent feathers were formerly highly esteemed as ornaments. The *L. argala* (Lath.), the Asiatic marabou or adjutant, has no equal in size except among the ostriches; the length from the point of the bill to the claws is 7½ feet, and the expanse of wings is nearly 15

feet; it stands 5 feet high. The bill is about 2 feet long, straight, strong, and sharp-pointed; the wings long and ample, the tail moderate and broad, tarsi strong, and toes long, the anterior webbed at the base. The head and neck are nearly bare of feathers, and in front of the neck hangs a pouch or dewlap several inches long and capable of considerable distention. The bill is yellowish white, and its gape is such that it can swallow whole an animal as large as a cat; front of the neck yellowish, back of neck reddish with a few hairy warty excrescences; the back and wing coverts deep bluish ash, wings dusky, breast and belly dusky white; the feathers of the sides beneath the wings, and those of the vent and under tail coverts, are whitish, downy, about 12 inches long, and so light and delicate as to command a high price for ladies' head dresses; a feather a foot long and 7 inches wide weighs only 8 grains. It is common in Bengal; it stalks about majestically, and each is believed to be possessed by the soul of a Brahmin and therefore invulnerable; it is called adjutant from its resemblance at a distance to an officer with white waistcoat and breeches. Its voracity is extreme, exercised upon anything which comes in its way, from offal, fish, and reptiles, to birds and quadrupeds, and even to the cooked meats of the natives; its services are valuable as a scavenger, and its presence is encouraged; it has even been domesticated. In the wild state, they live in small flocks near the mouths of rivers; their power of flight is great, and their vision very keen. A smaller species (*L. marabou*, Temm.) occurs in tropical Africa, assisting the vultures in consuming the filth of the negro villages; it is more ugly, if possible, than the Asiatic bird, and its delicate plumes are equally valued; *marabou* is the native African name. Other species are described, with similar characters.

MARABOUT (Arab. *marbouth* or *morabeth*, hermit or saint), a name given to religious devotees among the Mohammedans of the Barbary States. Originally it appears to have been applied in its plural form to a tribe or sect of Arabs who established themselves in the deserts of northern Africa, and were distinguished for religious enthusiasm. Throughout the Barbary States the tombs of the Marabouts are conspicuous objects, being generally built in the open country, and regarded by the people with much reverence. The living Marabouts frequently affect to work miracles, and some of them are held in high esteem, while others are regarded as little better than vagabonds.

MARACAYBO, MARACAIBO, or NUEVA ZAMORA, a seaport of Venezuela, and the capital of a province of the same name, situated on the W. shore of a channel which connects the lake and gulf of Maracaybo, in lat. 10° 41' N. and long. 71° 40' W.; pop. 14,000. It is built on a dry sandy soil, and its houses are generally constructed of chalk and sand or of wood and thatched with reeds. The climate is very sultry, and violent storms and earthquakes are often ex-

perienced. The city has also suffered from many destructive fires. The inhabitants are mostly engaged in ship building and navigation, but there is also an active trade with the provinces of Merida and Truxillo and with New Granada. The harbor is safe, deep, and well fortified, but obstructed by a shifting bar at its mouth, on which there is only 10 feet of water at high tide.

—**MARACAYBO, LAKE OF**, a large lagoon forming the most extensive sheet of water in South America; length, 100 m.; greatest breadth, 80 m. It is oval in form, and lies immediately S. of the above described city. The channel connecting the lake with the sea is 14 m. long and from 4 to 14 m. wide, and deep enough except over the bar at its mouth for the largest vessels. The shores of the lake are low and barren, and at certain seasons are inundated to a distance of 10 or 20 m. Its waters, being fed by over 500 small streams, only about 100 of which however are perennial, are generally fresh. On the N. E. shore is a mine of mineral pitch which sends out at night a brilliant phosphoric light.—**MARACAYBO, GULF OF**, or gulf of Venezuela, an inlet of the Caribbean sea on the N. coast of Venezuela, extending N. and S. a distance of 75 m., and E. and W. 150 m. On the E. lies the peninsula of Paraguana, to the S. of which is that part of the gulf called El Golfoete. At its opening, between Cape San Romana and Punta Espada, the gulf is 60 m. wide.

MARANHÃO, or **MARANHAM**, a province of Brazil, bounded N. by the Atlantic, E. and S. E. by Piauí, S. W. by Goyaz, and N. W. by Grão Para; area, 96,000 sq. m.; pop. in 1856, 360,000. The river Parnahiba forms the E. frontier, various affluents of the Tocantins rise on the S. W. borders, and the Maranhão and Itapicuru fall into the bays of San José and San Marcos a little W. of the central part of the coast. The coast E. from this point is unbroken by a single considerable indentation. The surface in most places is mountainous, and much of it is covered with dense forests, from which several valuable species of timber are procured. Rice, cotton, and sugar cane are the staples of cultivation.—

MARANHÃO, or **SAN LUIZ DO MARANHÃO**, the capital of the preceding province, is situated on an island of the same name, in lat. 2° 31' 42" S., long. 44° 18' 42" W.; pop. 86,000. The island is 20 m. long, and is separated from the continent by a narrow channel called the Rio do Mosquito, while on either side of it are the bays of San José and San Marcos, the embouchures of the Maranhão and Itapicuru rivers. The town is built on a peninsula between two small inlets on the W. side of the island, and is shut in from the rear by steep hills. Its harbor is difficult of entrance, but otherwise good. The streets are crooked and ill paved, but the plan of the town is regular, the houses, built frequently of sandstone, are generally two or more stories high, and one section is adorned with numerous gardens. The public buildings comprise 10 or 12 churches and chapels, a Jesuit college, several convents, the bishop's palace, several hospitals,

the governor's residence, and the town hall. Maranhão is the entrepot for 6 provinces, and has an important trade with foreign countries, the imports comprising European manufactures, and the exports rice, cotton, rum, medicines, and a kind of butter made of tortoise eggs, and called *manteiga de tartaruga*.

MARANON. See **AMAZON**.

MARAT, **JEAN PAUL**, a French revolutionist, born of Protestant parents at Blandy, in the principality of Neuchâtel, in 1744, assassinated in Paris, July 13, 1793. Of his earlier years not much is known. He was educated as a physician, and became deeply learned in medical science; but the narrow sphere in which he lived offering scanty means to satisfy his ambition, he went abroad. At 30 years of age we find him at Edinburgh, where he obtained a living as private tutor. At that time he published a revolutionary pamphlet in the English language, entitled "The Chains of Slavery," which appeared in French at Paris in 1792. In the following year, by a more voluminous publication (*De l'homme, ou des principes et des lois de l'influence de l'âme sur le corps et du corps sur l'âme*, 3 vols., Amsterdam, 1775), he entered the arena as an opponent of Voltaire, who accepted the challenge, and a literary controversy ensued between them. In a series of writings, brilliant with paradoxical assertions plausibly maintained, Marat attempted to revolutionize natural philosophy, and to refute the Newtonian theory. His success being far inferior to his pretensions, he relinquished the field of literature and went to Paris, and settled there as a physician. The violence of his character and his obstinate adherence to his peculiar notions prevented his obtaining a practice sufficient for his wants; and after many disappointments he was obliged to accept a position as veterinary surgeon to the count of Artois, afterward Charles X. At last the outbreak of the revolution gave him the long desired opportunity of letting loose his wild schemes upon society. From the very commencement of the popular movement he played the part of the most restless demagogue. Although physically he was not prepossessing, being only five feet high, with a strange mixture of the ludicrous and terrible in his countenance, he soon obtained a vast influence over the lower classes by his energy and resolution. On Sept. 12, 1789, he published the first number of the *Publiciste Parisien*, whose title was afterward changed into *Ami du peuple*. Never has human language been used for the expression of wilder passions, of more reckless fanaticism, of a more savage thirst for revenge, than in this publication. As early as Aug. 1789, Marat had publicly proclaimed that 800 members of the national assembly ought to be hanged, Mirabeau the foremost among them. In the same spirit every page of the *Ami du peuple* was written. Having been introduced by Danton into the club of the Cordeliers, he created there disturbances so violent that the municipality ordered his arrest in Jan. 1790. He

evaded it by secreting himself in the cellars of the Cordeliers, whence he continued to issue his periodical. After the king's unsuccessful attempt at flight, Marat again ventured into publicity, and directed his attacks against the Girondist party of the legislative assembly. Having been prosecuted in consequence, he returned to his former underground haunts, from which he again emerged in Aug. 1792. He now became the right hand man of Danton, at that time minister of justice, introduced himself into the vigilance committee established by the municipality of Paris, and was one of the chief instigators of the horrible massacres of Sept. 1792. To reward him for the part he had taken in these atrocities, the people of Paris sent him to represent them in the national convention. The speeches he made there were like his writings, and were received by the party which at that time constituted the majority with a feeling of abhorrence mingled with contempt. They moved a vote of censure against him for having advocated the establishment of a dictatorial power. When, after angry discussions, the motion was at last withdrawn, Marat produced a pistol from his pocket, exclaiming that, if the motion had passed, he would have blown his brains out in the presence of the convention. Emboldened by impunity, he grew more fanatical every day, and in his paper (the title of which had been again changed on Sept. 21, 1792, into *Journal de la république Française*) openly asked for the heads of 270,000 "traitors," and the massacre of three fourths of the members of the convention. In vain the Girondists endeavored to break down his influence. Under the pressure of popular excitement, created by foreign intervention, the ultra-revolutionary party had gradually obtained the ascendancy, and the most sanguinary proceedings being considered unavoidable in order to prevent a co-operation of the anti-revolutionary elements with the foreign foe, Marat, who excelled all others in this respect, was almost adored by the Parisians as the saviour of the country. Thus, in April, 1793, he succeeded in obtaining the passage of a "law for the arrest of suspicious persons," by the operation of which no fewer than 400,000 individuals were imprisoned throughout France. Having, as chairman of the Jacobin club, signed an address to the people, in which the assassination of the Girondists was openly called for, he was prosecuted before the revolutionary tribunal. But his trial became a triumph. The public prosecutor, the jurors, and the audience did him homage as if he were a supernatural being, and he was carried in triumph to the national convention, where Danton delivered an eloquent eulogy in his honor. He now rapidly rose to the culminating point of his career. Having made the municipality subservient to his plans, he instigated the mob of May 31, 1793, by which the Girondist party was completely destroyed. With Robespierre and Danton he formed a sort of triumvirate, which, by legal or illegal means, deter-

mined the destinies of France. Marat, however, played more the part of an electrical chain, by which the rulers remained in direct communion with the instincts of the masses, than of a leading spirit. Confined by disease in his garret, he remained restlessly active in stirring up, by letters and denunciations, the passions of the people and of the national convention, though Robespierre and Danton paid little attention to him. He was finally assassinated by Charlotte Corday, while preparing a list of Girondists to be sacrificed to the common weal, only a few days before his life would probably have ended by natural causes. Robespierre used his death as a pretext for carrying the reign of terror to its utmost extent. Hundreds of victims were sacrificed to the "manes of the martyr." The entire national convention attended his funeral. His body was transferred, Nov. 4, 1793, to the Pantheon, and his portrait, executed by the celebrated David, adorned the hall of the convention. A pension for life was voted by the "grateful nation" to his concubine. Two years later, when the revolutionary passions had cooled down, the remains of Marat were removed from their resting place and his portrait taken down. Though vain and egotistic, Marat was perfectly sincere in his sanguinary ravings, and so disinterested that, even in the height of his power, he lived in the most abject poverty.

MARATHON, a N. co. of Wis., bordering on Mich., and drained by the Wisconsin river and its branches; area, 6,048 sq. m.; pop. in 1855, 1,427. It has a diversified surface, extensive pine forests, and numerous small lakes. Capital, Wausan.

MARATHON, a town of Attica, in the demus of the same name, near the eastern coast, celebrated by the victory of the Athenians under Miltiades over the army of Darius (490 B. C.). (See GREKOR, vol. viii. p. 441.)

MARATTI, CARLO, an Italian painter, born in Camarano in 1625, died in Rome in 1718. At about the age of 12 he was sent to Rome and put under the instruction of the painter Andrea Sacchi, with whom he remained 8 years. He became a student of the works of Raphael, and his contemporaries, supposing that he could only paint madonnas, called him *Carluccio delle Madonne*; but he silenced their sneers by executing for the baptistery of St. John Lateran a picture of Constantine destroying the idols, which caused him to rank among the first painters of the day. His works are numerous in the churches and palaces of Rome. He also restored the frescoes of Raphael in the Vatican, and those of Annibale Carracci in the Farnese palace. His masterpiece is said to be the "Martyrdom of St. Biagio" at Genoa.

MARBLE, a rock used as an ornamental building stone, for interior decorations and for sculpture. Generally, any limestone that can be obtained in large sound blocks, and is susceptible of a good polish, is marble; and the only marble that is not limestone is the serpentine and the verd antique (the latter a mixture of

serpentine and limestone). It is found in beds in various geological formations. In the azoic group it is a metamorphic rock of granular and crystalline structure, and often presents a fineness of texture and purity of shading that fit it for the choicest works of the sculptor. In the palaeozoic formations it bears more of the character of a sedimentary rock, and it is apt to contain organic vestiges, as corallines and fossil shells, which indeed sometimes compose nearly its whole substance; it is also of variegated colors, and sometimes is of brecciated structure, evidently made up of fragments of an older rock, the layers of which, broken up and confusedly rearranged, have been cemented together. Though thus varying greatly in color, texture, and structure, the composition of marble is for the most part essentially the same; it is a carbonate of lime, or a combined carbonate of lime and carbonate of magnesia, and is readily burned to quicklime. It is soft and easy to work with the chisel or hammer, generally of even grain, so as to be split with wedges, and of specific gravity about 2.7, making the weight of a cubic foot about 169 lbs. Its durability is very variable, some varieties retaining sharp edges when exposed for many years to the weather, and others, especially the dolomites, soon crumbling away. (See *DOLOMITE*).—Many varieties of marble have acquired a name and celebrity from remote times. The ease with which the rock is worked caused it to be selected for the earliest structures. Wilkinson states that "the most ancient buildings in Egypt were constructed of limestone, hewn from the mountains bordering the valley of the Nile to the E. and W., extensive quarries of which may be seen at El Masara . . . and other places; and that it was used long before sandstone is proved by the tombs of the pyramids as well as those monuments themselves, and by the vestiges of old substructions and ruins in Upper Egypt. Limestone continued to be occasionally employed for building even after the accession of the 12th dynasty." The more durable nature of the sandstone then discovered, and the greater ease with which it was quarried and worked, caused this rock to be substituted for the limestone or marble. The names of many marbles famous among the ancient Greeks and Romans are still retained, and their localities are known. Mt. Pentelcus in Attica furnished the valuable Pentelican white marble, called by the moderns Penteli marble; the islands of Paros and Naxos near Attica, the still celebrated Parian marble; and other similar white marbles came from Mt. Hymettus in Attica, and from Thasos and Lesbos, from Corallo in Phrygia, Cyzicus on the Propontis, and one variety, exceeding the Parian in whiteness, from Luna in Etruria. Of the first named (the Pentelican) the Parthenon was built, and also the temple of Ceres at Eleusis, beside many celebrated statues. Though of finer grain than the Parian, it is said not to retain its polish and beauty so well. The Parian marble is placed first by both Theophrastus and Pliny in their enumeration of ancient mar-

bles. Pindar and Theocritus also celebrated its praise. Its whiteness was regarded as peculiarly pleasing to the gods, and it was chosen for the works of Praxiteles and other eminent sculptors. The statues of Venus de' Medici, Diana Venatrix, the Oxford marbles known as the Parian chronicle, and many other famous works, are of this marble. Black marbles are occasionally referred to by the ancients; but some of those named, as the *Chium marmor* from the island of Chios, appear to be of questionable character. This one is sometimes called *lapis obsidianus antiquorum*. It was glossy black, and received so high a polish that it was made into mirrors. There was also a black obsidian obtained from Ethiopia. The name, however, may have been applied to real marbles, being possibly a corruption from *opasianus* (*οψιανος*, *απο της οψιως*), having reference to any peculiar appearance. The green marbles were serpentines from various localities. Yellow marble was obtained at Corinth. The *marmor Phengites* was white with yellow spots; the Rhodian was marked with spots of a golden color, and that of Melos yellow.—The marbles of modern times have been variously classified and named. In southern Europe two general divisions are made of antique and modern. The quarries of the former being lost or abandoned, the stone is obtained only from ancient monuments; and being consequently most highly prized, methods are resorted to, and sometimes with success, to attach the name antique to stone from quarries now worked. It is also the case that some of the marbles held in the highest estimation in France, being transported from monuments at Rome, are the products of quarries worked in ancient times in France. It is probable these might be again discovered. Without reference to these marbles, however, the French boast that their country surpasses even Italy in the beauty and variety of this class of stones. The following are convenient divisions in which marbles may be arranged for a general notice of the most important of them: 1, the simple or single-colored marbles; 2, the variegated; 3, the brecciated; 4, the lumachella or fossiliferous. These sorts, however, pass into each other, so that some may be placed indifferently either in one or the other of two groups. 1. The best known of the first class are the plain white marbles, some of which have been already named. The white marble of Carrara, of which an account is given in the article *CARRARA MARBLE*, is of a texture like loaf sugar, differing in this respect from the Parian marble, which on close examination appears to be made up of the most delicate plates or scales, confusedly but most closely united together. Pure black marble is found in some ancient Roman sculptures. Some varieties of it are obtained in Derbyshire, England, and in Kilkenny, Ireland; but as the latter is more or less intermixed with fossil shells, it should come under the 4th division. It is quarried in the United States at Shoreham, Vt., and Glen's Falls, N. Y., and specimens are

obtained from some other localities. The colored marbles are generally variegated; but the Sienna marble of Italy is sometimes of a uniform yellow color, or the same clouded. Some of the red marbles of Italy also display only the one color. In North America white marbles are worked at various places on the range of the great belt of metamorphic rocks through Canada, Vermont, western Massachusetts, a little back of the cities of New York, Philadelphia, Baltimore, and Washington, and thence through Virginia and the Carolinas into northern Georgia and Alabama. It is this formation that supplies the white marble for building purposes to the different cities along its range, and its quarries in Massachusetts and New York furnish the marble for the most costly edifices of southern cities. The statuary marble is only the finest grained variety of this common building stone. Many localities are known to furnish it in small beds interstratified with the coarser marble. In Vermont only have they been opened of sufficient thickness to justify working them. The quarries of Rutland furnish marble of exceedingly delicate texture and purity of whiteness, and the blocks are large and sound, and quite as beautiful as the statuary marble of Carrara. The objections to it are that it is harder and more brittle than the foreign; these defects will probably diminish as the stone is obtained from beneath deeper cover. 2. The variegated marbles are those variously spotted, shaded, and veined. They are the most numerous class, and include the most beautiful of the colored marbles. None are more highly esteemed than the variegated yellow marble of Sienna. This and the Italian dark red marbles may be seen in many of the costly mantels in our marble shops; and also the soft, shaded, dove-colored Lisbon marble, of which are made the smaller columns in the entrance of the Unitarian church at the corner of 4th avenue and 20th street, New York. The black Genoese marble, with golden-colored and white veins, called Portoro marble, the best of which is from Porto Venese, has for many years past been the most popular and the best known foreign marble in all parts of the United States, though now rather out of fashion. It is a weak stone, and is for the most part used in thin slabs cemented upon a back of slate. The marbles of this class found in the United States east of the Rocky mountains have not attained much celebrity, nor do we know of any worthy of it, unless we should include among them certain varieties of the brecciated marbles from northern Vermont and Tennessee. The gray and white clouded limestones of Thomaston, Me., are quarried to considerable extent for marble, and may be seen in common use in portions of the eastern states. They possess little beauty. California has furnished of this class some very showy marble of brilliant reddish and brownish colors, and susceptible of a high polish. It is imported into New York and used for mantles. 8. The brecciated marbles are composed of angular fragments, it may be of various mineral substances, united in

a bed or paste of calcareous cement; or the mass may be so divided by numerous veins into pieces as to present the appearance of broken fragments irregularly united. Brocatellas are breccias, in which the fragments are very small; we incorrectly apply the name only to a reddish brecciated marble brought to this country from Spain. The varieties of this class are very numerous; but some of the most celebrated are never seen here—such for instance as those called *le grand deuil* and *le petit deuil*, literally the full mourning and the half mourning. These come from the Pyrénées and different parts of France; they are of a black ground spotted with white fragments. Among the brecciated marbles of the United States, the best known is that of the Potomac on the Maryland side, some miles below the Point of Rocks. The principal use that has been made of it was to furnish the columns in the old chamber of representatives at Washington. The irregularities of hardness in the different ingredients render it an expensive stone to work; still the quarries are deserving of more than government patronage. The stone is certainly handsomer than the Italian red and white breccia imported for the inner columns of the central arched entrance of the church in 4th avenue. Quarries have been recently opened in the northern part of Vermont, near Lake Champlain, which produce the most beautiful of the American colored marbles. They are brecciated, though they pass into the variegated. They present a great variety of colors, from a deep red, traversed with veins of white, to rose-tinted flesh color mottled with whitish spots. In some specimens the brecciated structure is very strongly marked, the fragments being large with sharp edges and of decided shades of dark red, drab, and salmon, upon a ground of white bordered with rose. Unlike the Potomac marble, the fragments are not different varieties of rock, but are all limestone. The stone, though somewhat hard for marble, is still of uniform texture and takes an even high polish. Some large blocks closely resemble the foreign brocatella. A small quantity of this stone has been purchased for the interior of the U. S. capitol. It is however very difficult to work. Other marbles of this character and of rather dark red colors abound near Knoxville, Tenn., and have recently been brought into notice by the extent to which they are employed in the construction of the new capitol at Washington. 4. Lumachella or fossiliferous marbles are those which contain petrified shells. These are sometimes so crowded upon one another, that they compose the whole mass of the stone; sometimes single shells are seen scattered throughout the block. A dark marble from Kilkenny, in common use for mantles and hearths, often presents a section on its polished face of the nautilus shell. The white spiral lines of the shell on the dark ground have exactly the appearance as if a rough-nailed heel had been carelessly spun around upon the surface; and many a nice housewife, but unskilled in paleontology, has tried in vain to rub

out the vexatious spot. These marbles are very abundant in Europe, and also throughout New York and the western states. Handsome mantles are made of American varieties which are composed entirely of fossil shells, but they are rather to be regarded as curious than beautiful. They lack the high colors of the brecciated and variegated marbles, and though they take a good polish, they are from their plain colors comparatively dull and sombre. Some of the best of the kind is from Becraft's mountain, back of Hudson, N. Y., which is thus noticed by Prof. Silliman ("American Journal of Science," vol. vi. p. 871): "The marble is of a grayish color with a slight blush of red; its structure is semi-crystalline, and in some places highly crystalline, especially in and around the organized bodies which in vast numbers it embraces. The large slabs present a great diversity of appearance, and can scarcely be distinguished from the similar transition marble of the Peak of Derbyshire, which it quite equals in beauty and firmness." In Hudson it has been used in many of the houses for ornamental work, and it has been introduced into New York.—Serpentine, as before stated, differs in composition from the other marbles. It consists of about equal parts of silica and magnesia with 12 per cent. of water. It is a soft mineral of different shades of green, of waxy lustre, and susceptible of a high polish. It is better adapted to ornamental work within doors than to be exposed to the action of the weather. Verd antique is a mixture of green serpentine and light-colored limestone. These varieties come from Genoa and Tuscany, and the best verd antique from Egypt. Some fine specimens from Italy are to be seen in the outer columns at the central entrance of the church already referred to; but they are in no respect superior to what might have been furnished from many of our own localities—from one not even 70 miles distant from New York. A quarry of serpentine and verd antique was worked more than 40 years ago at Milford, Conn., $1\frac{1}{2}$ m. from the present station on the New Haven railroad. Slabs of it were used in the adjoining town of New Haven for fireplaces, some of which are still to be seen. Some are also preserved in the mineralogical collection of Yale college, and other slabs in New York city. These are quite as fine and beautiful as the verd antique columns alluded to, and their size and soundness are such as fully to justify the expectation that the quarry, if properly reopened and worked, would afford good blocks of any required size. The locality has been highly recommended by Professors Silliman, Charles Upham Shepard, and Renwick. Brongniart, the celebrated mineralogist, in a letter to Prof. Silliman, quoted by him in the "Journal of Science," vol. ii. p. 165, speaks of a polished specimen he received as "one of the ornaments of my cabinet, and is referred with great precision to my *ophtiques veinées*" (verd antique marble). The blocks that have lain about the surface for 30 or 40 years

have assumed a hardness that might discourage one ignorant of the fact that freshly quarried stone from under deep cover is always much softer to work; and so one familiar with the proper mode of quarrying would see that by heavy deep blasts, and then by judicious splitting with wedges, the former great waste of throwing a rock without grain like this by small charges of powder into fragments may be avoided. We cannot believe that a quarry furnishing such beautiful marble as this, so convenient to transportation, should much longer be suffered to lie neglected, when we find stone no better imported from the Mediterranean. In Vermont and Canada serpentine abounds; and verd antique may be obtained in various places in New York and Pennsylvania, and in any of the New England states. Quarries of serpentine have been recently opened at Roxbury, Vt., and the stone is already favorably introduced into Boston, a block of it having been selected for the pedestal of the statue of Franklin. A quantity of this stone was purchased for the capitol at Washington, but it was found to be too brittle for any tool but the saw. Its use was therefore abandoned, and the stone has been sawed into tiles for the flooring of the treasury extension. This variety is described by Dr. Hayes, who has subjected it to a chemical examination, as a peculiar mixture of various magnesian minerals, as talc, asbestos, and chlorite, with fragments of slate, cemented together by a white paste composed of anhydrous carbonate of magnesia. It has been supposed to be verd antique; but finding that it contains no carbonate of lime, he proposes for it the name of serpentine marble. For durability he considers that it should be classed with the granites, the most durable of all building stones. In this quality its composition indicates that it must be superior to the ordinary serpentines, the above named minerals being remarkable for their resistance to the ordinary causes of change of appearance. Serpentine, as seen at the quarries, are liable to change upon the surface to a reddish brown by the peroxidation of the salts of iron they contain; it is probably for this reason that they are not more used in situations exposed to the weather. A want of grain prevents the stone from being split into blocks; but when freshly quarried it may be sawed almost as easily as marble. It is highly recommended for building purposes in the excellent treatise called the "Model Architect," by S. Sloan of Philadelphia, as follows: "There is one material, which we wish we could dwell on at length—the serpentine rock, such as is found in Chester co., Penn. Nothing can be better for a certain class of cottages, its greenish hue giving it a rural expression of the most pleasing kind. The walls already built of it promise to last well, and we would recommend it wherever it can be obtained as a most excellent material, and more easily worked than any other, since it is soft when first quarried and hardens on exposure."—The divisions we have named of the ornamental marbles are consider-

ably multiplied and subdivided by the French and Italians; but they are quite sufficient for the very limited number of varieties we have as yet occasion to be familiar with in this country. As new regions are opened, new localities will be discovered, and many already known will be made accessible by new railroads. In time, doubtless, many varieties of our own marble from quarries yet unknown will acquire as high a popularity as that of many now brought to us across the Atlantic.—Marble is largely employed in the United States for public buildings and the fronts of stores in the cities. Among the most important structures of it are the capitol at Washington, Girard college in Philadelphia, the custom house at Charleston, S. C., that at New York, and the city hall of New York. The fine pillars of Girard college are formed chiefly of stone from Berkshire, Mass., and the other parts of the building are of marble from quarries near Philadelphia. The custom house at Charleston was built of stone from Massachusetts and from a quarry at Hastings on the Hudson. Every block was fitted at the quarry for the place it was to occupy in the building, and was marked with a number corresponding to one on the plan. The New York custom house is of marble from Tuckahoe in Eastchester, near the Harlem railroad. The quarry there affords stone in very large blocks, and its composition is nearly that of a pure carbonate of lime, while most of the other white marbles are dolomites. The marble of Sing Sing is a true dolomite, and of a variety disposed to disintegrate and rapidly crumble away. The New York city hall is of Massachusetts marble. In the selection of the marble for the extension of the U. S. capitol careful experiments were made by the commission appointed for this purpose in testing the qualities of the different kinds offered. The results were reported in full to congress, and some facts of general interest were presented by Professor Joseph Henry in a paper read before the American association for the advancement of science, and published in the annual report of the Smithsonian institution for the year 1856. To determine the comparative durability of marbles no tests are so satisfactory as actual use; and in this country the time that any of them have been employed is too short to be of much service in this respect. The natural causes of change can be but imperfectly imitated by artificial methods. One of the most destructive agents is the change of temperature by freezing and thawing; yet the effect of this is perceived in good marble only after a long series of years. Specimens of the marbles were submitted to the influence of freezing mixtures, in some instances as many as 50 times, and usually for 24 hours at a time. The effect of this upon the best varieties was to cause an exfoliation calculated from the loss of weight to amount to nearly the $\frac{1}{10}$ part of an inch. From this cause alone, therefore, supposing the alternate freezings and thawings amounted to 50 times every

year, the surface of the marble would be exfoliated to the depth of an inch in 10,000 years. In testing the strength of the marbles, or their capacity to resist pressure, the same apparatus was employed that was devised by Major Wade for testing the strength of gun metals. The specimens were made into cubes of $1\frac{1}{2}$ inch face, and the action of the machine was upon the two surfaces which were parallel to the natural bed of the stone. In applying the pressure the remarkable fact was discovered, that when, as commonly practised in testing the strength of stones, a thin plate of lead was interposed between the stone above and below and the steel plate which pressed against it, the stone gave way with about one half the pressure required to produce the same effect when no lead was present and the steel plates bore directly upon the surfaces, which by a machine specially constructed for this purpose had been ground into perfect parallelism. With the plates in contact with the stone, this withstood in one instance a pressure of more than 60,000 lbs., while with the lead a precisely similar stone gave way with about 30,000 lbs. pressure. The same results were obtained without exception in a great number of trials of pairs of different marbles; and they show that the crushing force required is much greater than that heretofore given for the same material. The specific gravity and the quantity of water absorbed by each marble were also determined. The marble selected is a fine-grained dolomite from a quarry in the S. E. part of Lee, Mass., for the most part white with occasional blue veins, of specific gravity 2.862, weighing per cubic foot 178.87 lbs. It absorbs .108 oz. of water per cubic inch, and its porosity is great in proportion to its power of resistance to pressure. It sustains 23,917 lbs. to the square inch. Its composition was found by Dr. John Torrey to be as follows in 100 parts: carbonate of lime, 54.621; carbonate of magnesia, 48.932; carbonate of protoxide of iron, .365; carbonate of protoxide of manganese, a trace; mica, .472; water and loss, .610. The mica is in small colorless crystals, visible only under the microscope. When this marble was placed in the walls, a remarkable brownish discoloration soon appeared, the cause of which after some time was traced to the evaporation of the water absorbed from the mortar and otherwise through its pores, and the deposition of the impurities brought along by the water. The remedy applied with success was to coat the surfaces laid in mortar with asphaltum.—The processes of preparing marble for use differ from the working of granite. This hard rock, after being quarried, is split by small wedges driven into holes drilled in a line, and is then dressed by hammers or used in the rough. Marble, being a comparatively soft rock, is cut into slabs by a process of sawing with smooth iron saws fed with sharp sand and water. Several of these plates or saws are set in one frame, and in a large establishment 20 or more of the frames may be seen kept in

steady operation by a steam engine. The progress of the saws cutting down through the great blocks of marble seems very slow, for the most part not exceeding an inch per hour. The thickness of the slabs is usually 4 or 6 inches. In this form the marble is used for facing the walls of buildings upon a back of brick, giving all the effect of a solid wall of marble at much reduced cost. Freestone fronts are put up with the same regard to economy. In the most expensive structures only are the walls built of solid blocks of marble or freestone. Marble slabs for mantles and other interior work are sawed like those for building, and are then rubbed smooth upon a heavy revolving table of cast iron, called the rubbing bed, and afterward polished. This business is extensively carried on in the numerous marble shops in the cities. It affords employment to various classes of artisans; and the designing of the more elaborate patterns and the carving of the stone often call for a high order of talent in these departments. —The imports of marble into the United States in the year ending June 30, 1859, chiefly from Italy, amounted to about \$172,000; manufactured marble was imported to the extent of about \$28,000. The exports of American manufactures of marble and stone, mainly to Canada, Cuba, and Australia, were valued at \$112,000.—In No. 392 of the "Journal of the Society of Arts" (May 25, 1860) is an elaborate paper by W. P. Jervis, F.G.S., descriptive of the various marbles of Carrara and its vicinity, entitled "On the History, Geological and Geographical Distribution, and Commercial Bearings of the Marbles of Tuscany and Modena, and of the Boracic Acid Lagoons of the Maremma." To this paper, and to the remarks made upon its reading before the society by different members, the reader is referred, for a large stock of information upon the great number of varieties of marble of this famous district, and the vast extent of its quarries. Upon the topographical map of the district, which accompanies the paper, are represented no fewer than 38 localities of quarries, all of which furnish varieties of marble more or less peculiar. The quantities appear to be sufficient for the supply of the world; but unfortunately, by reason of the government restrictions and imposts, and the ill-directed enterprise of the proprietors, the capacity of the quarries, though worked for centuries, is little developed; and the expense of getting the stone to the coast of the Mediterranean, only a few miles distant, over miserable ox tracks in "antediluvian ox wagons," and then of placing it on shipboard, is so great as to limit the trade to a very small proportion of the extent it would reach under a more judicious system of operations. The exports of marble from Carrara from 1837 to 1846 were valued at £370,341; and the total produce of 1847 was estimated as worth £66,189, during which time the trade gave employment to 2,258 persons. The following table, prepared by Sig. Fabbricotti, is given as presenting a near ap-

proximation of the present extent of the business:

| Localities. | Statuary marble in blocks, tons. | All other kinds in blocks, tons. | Slabs, carvings, sculptures, architectural work, tons. | Total, tons. |
|----------------------------|----------------------------------|----------------------------------|--|--------------|
| Carrara produces about . | 2,900 | 48,867 | 5,518 | 54,785 |
| Massa produces about . . . | 106 | 2,792 | 1,511 | 4,409 |
| Total in Modena | 3,006 | 49,159 | 7,029 | 59,194 |

"Of the marble in blocks, about half is exported to the United States, which appears to be a steady and good market. Of the other half, one third is exported to Great Britain, and two thirds to the rest of Europe. A heavy duty is levied on Italian marbles in France, in order to keep up the demand for home produce. Notwithstanding these disadvantages, Carrara marble is much used there. The weight of Carrara is about 160 lbs. per cubic foot. That of Sienna marble is about 180 lbs.; it is sold by weight. The price of labor at Carrara is about 2s. per diem for common laborers; 2s. 6d. to 3s. for skilled quarrymen; 4s. for the best and most intelligent workmen. No vessels can load at the beach below Carrara, Massa, or Serravezza, direct for this country, as the depth of water is so inconsiderable, though coasters go as far as Naples, Marseilles, Genoa, and Leghorn." The foreign shipments are made from Leghorn. Those to Great Britain in 1859 consisted of sawn or otherwise manufactured marble 593 tons 12 cwt., worth £29,678, and of rough blocks or slabs 89,740 solid feet, worth £49,358. The London prices per cubic foot, which fluctuate considerably, are given as follows:

| | | | |
|--|----|------|-----|
| Superior statuary marble fetches as much as | £3 | 0s. | 6d. |
| First quality, from | £1 | 15s. | 6d. |
| Second quality | 0 | 16 | 0 |
| Bavaccone, incorrectly called Sicilian | 0 | 7 | 6 |
| Veined white, Bianco chiaro | 0 | 8 | 0 |
| Carrara, Dove, or Bardiglio | 0 | 9 | 6 |
| Serravezza Dove, or Bardiglio | 0 | 11 | 6 |
| Portoro | 0 | 14 | 0 |

The cathedral of Milan, one of the most wonderful marble structures in the world, in respect not only of size, but also for the elaborate finish and delicacy of its architecture, and for its dazzling brilliancy when illuminated by the sun, is commonly supposed to have been built of Carrara marble; but it is only the 4,000 statues which stand on brackets or crown the pinnacles that are of this stone. The cathedral itself is built of marble from quarries given to the church by the first duke of Milan, Giovanni Galeazzo Visconti, and situated in Monte Candoglio or Candido, on the Toce, a tributary of Lago Maggiore. Although the foundation was laid in 1386, the durability of the stone cannot now be fairly judged of, as the exterior has just undergone an entire repair, the decayed parts being carefully removed.—The Tuscan quarries of Serravezza, including Stazzema and the Altissimo, produce about 253,158 cubic feet of marble annually, in blocks and slabs, valued at £195,000, and also squared paving flags to

the amount of about £190,000 more. The following are the prices of Tuscan marbles at Serravezza per cubic foot:

| | | | |
|--|----|-----|-----|
| Statuary from the Altissimo, &c..... | £3 | 8s. | 6d. |
| Bavaglione, "Sicilian," from Cernigiala, Salajo, Costa at Serravezza, &c..... | 0 | 8 | 8 |
| Veined, or Bianco chiaro, Travertiserra, Cam- panice, Carchio, &c..... | 0 | 6 | 9 |
| Mischio di Serravezza..... | 0 | 16 | 2 |
| Bardiglio..... | 0 | 8 | 0 |
| Bardiglio fiorito, Stazzema..... | 0 | 6 | 6 |

—**MARBLE, PLAYING**, a little ball of marble, baked clay, agate, or other stony substance, used as a toy for children. Marbles are made in immense quantities in Saxony for exportation to the United States, and to India and China. They are also largely manufactured in the agate mills at Oberstein on the Nahe, in Germany, particularly for the American market. The material used in Saxony is a hard calcareous stone, which is first broken up into square blocks with a hammer. These are then thrown 100 to 150 together into a mill, which is constructed of a stationary flat slab of stone, with a number of concentric furrows upon its face. Over this a block of oak of the same diameter, partially resting upon the small stones, is kept revolving, while water flows upon the stone slab. In 15 minutes the marbles are worn completely round, and are fit for sale. An establishment with 8 mills will manufacture 60,000 marbles in a week. Agates are made into marbles at Oberstein by first chipping the pieces nearly round with a hammer, and then wearing them down upon the face of large grindstones. The hard stones are managed with great dexterity by the workmen, who in a few minutes bring them into the shape of perfect spheres.

MARBLEHEAD, a town of Essex co., Mass., 4 m. E. from Salem, and 16 m. N. E. from Boston, with which city it is connected by a railroad; pop. in 1855, 6,167. It is built upon a peninsula projecting into Massachusetts bay, about 4 m. in length and 2 in breadth, with an area of about 8,700 acres. The surface is elevated, and is exceedingly irregular and rocky. The harbor is deep and convenient, and is about 1½ m. long by ¼ m. wide. The town has been noted from the first settlement of New England for the enterprise of its people in the fisheries. Of late years, however, this branch of business has been comparatively neglected, and the inhabitants have engaged in the manufacture of boots and shoes, which were made in 1855 to the value of \$1,020,378. There were also produced glue to the value of \$20,000; boxes, \$15,000; ship's bread, \$35,850; oakum, \$17,600; machines, \$10,000; and a considerable amount of cordage, sails, &c. Marblehead was originally a part of Salem, and was incorporated as a distinct town in 1649, at which time it contained 44 families. Many of the settlers were from the Channel islands, Guernsey, Jersey, &c.; and their peculiarities of language are still to be noticed among the inhabitants, and formerly existed to such a degree as almost to constitute a peculiar dialect. At the commencement of the revolutionary war

Marblehead was reckoned the second town in Massachusetts in population and wealth. It contributed a regiment of 1,000 men to the revolutionary army, and at the end of the war there were 600 widows and 1,000 fatherless children in its population of less than 4,000. During the war of 1812 the frigate *Constitution* was chiefly manned by men from Marblehead, and the town also sent out a great number of privateers; and when peace was declared it was found that 500 citizens of the place were held in England as prisoners of war.

MARBOIS, BARBÉ. See **BARBÉ-MARBOIS**.

MARBURG, a German town, capital of the province of Upper Hesse in Hesse-Cassel, situated on the river Lahn, 60 m. by railway N. by E. from Frankfort-on-the-Main, and 65 m. S. W. from Cassel; pop. about 9,000. The principal public buildings are the church of St. Elizabeth and the ancient castle of the land-graves of Hesse on the Schlossberg (now used as a penitentiary), where the famous religious conference between Luther and Zwingli took place, Oct. 1-3, 1529. The university of Marburg was the first founded in Germany after the reformation, by the landgrave Philip the Generous (May 30, 1527); it was richly endowed from the proceeds of the confiscated property of the clergy, and attracted students from all parts of Protestant Europe. Although a rival university was established in Giessen in 1607, it continued to flourish until the outbreak of the 80 years' war. From 1625 to 1650 the Giessen university was united with that of Marburg, but they have since been again separated, the former being now the national university of Hesse-Darmstadt, and the latter that of Hesse-Cassel. In the first part of the 18th century Marburg derived great celebrity from the philosopher Christian von Wolf, who officiated as one of the professors. The university is still annually attended by about 800 students; the number of professors is 40, and that of private teachers about 12. It contains a library of 112,000 volumes, an anatomical theatre, an observatory, an admirable chemical laboratory, a botanic garden, a lying-in asylum, a clinique, a school for veterinary surgeons, a zoological museum, a philological seminary, and one for political sciences. Marburg possesses also a gymnasium with 200 pupils, and other educational institutions; a society for natural history, and a Bible society. The town was several times besieged during the 7 years' war. In 1806 and 1809 it was the scene of the rising of the Hessian peasantry against the French, who destroyed in 1810 and 1811 the greatest part of the fortifications of the castle.

MARCO ANTONIO. See **RAIMONDI**.

MARCELLUS, **MARCUS CLAUDIUS**, a Roman general, born about 267 B.C., killed near Venusia in 208 B.C. The family to which he belonged (a plebeian branch of the great Olandian *gens*) was of the highest distinction in Rome, and of aristocratic politics. Marcellus was early known as a bold and skilful soldier, serving in

the first Punic war. His first office was that of curule ædile, to which he was chosen about 226. Shortly afterward he was elected augur, and in 222 he was made consul. While holding that office he brought the Gallic war to a successful termination, killing the leader of the Gauls with his own hands, for which he was allowed a triumph, though the friends of his colleague Scipio claimed that he was entitled to a great part of the honor. Marcellus dedicated the spoils of the Gallic chief as *spolia opima* in the temple of Jupiter Feretrius, being the third and last instance of such dedication in Roman history. He was one of the prætors in 216, when the second Punic war was at its height, and was about to sail for Sicily, when the defeat of the Romans at Cannæ caused a change in his destination. Employed against Hannibal, he prevented the town of Nola from falling into his hands, and repulsed his forces, which was the first check received by the Carthaginian. He was summoned to Rome, to take part in the consultations concerning the conduct of the war, and then sent back to Campania as proconsul. Elected consul in 215, he resigned the office rather than offend the senate, which was averse to the whole consular power being in plebeian hands, his colleague being of the *plebs*. Returning to his proconsular position in Campania, he again baffled Hannibal at Nola, and inflicted great loss on his army. He was elected consul in 214, having Fabius Maximus for his colleague, and resumed his Campanian command, defeating Hannibal at Nola for the third time. Casilinum having surrendered to Fabius, on terms, Marcellus massacred all the garrison but 50. He was then sent to Sicily, which he nearly conquered in three years. The siege of Syracuse, which he maintained with true Roman pertinacity for two years, and which was opposed by the science of Archimedes, who was killed during the sack of the town, was one of the most famous sieges of ancient warfare. Returning to Rome in 211, he was refused the honors of a triumph because he had not entirely subdued Sicily. His ovation was very brilliant, but the magnificence of his Sicilian spoils, comprising rich works of art, gave much offence to the old Roman party. He was a 4th time consul in 210. Prevented from returning to Sicily by the opposition of the Sicilians, whom his cruelty and rapacity had alienated, he was placed at the head of the army that acted against Hannibal that year, and the next year retained the command of it as proconsul. During these two years he was, according to the accounts of his countrymen, engaged in several battles with Hannibal, in which the honors of the field were not unequally divided; but not the slightest credit is due to these relations, and it is asserted by Polybius, the best authority, that he never defeated the Carthaginian. The Romans complained of his want of vigor during the latter part of his proconsulate, but he defended himself successfully, and was elected consul for the 5th time. Having appeased the Arretians, who

threatened revolt, he again assumed command of the army in presence of Hannibal, his colleague being with him. While reconnoitring the Carthaginian camp, he fell into an ambuscade, and was slain. Hannibal caused his body to be burned, and sent the ashes to his friends. The life of Marcellus has been written so eulogistically that it is difficult to ascertain the facts of his career; but enough of it is known to show that he was a brave and energetic soldier, and that he was as cruel and ferocious in dealing with his country's enemies as he was devoted to that country's cause.

MARCH, in military science, the walk or movement of soldiers in order from one place to another. It is usually of 8 degrees of quickness, viz.: ordinary time, in which about 75 steps are taken in a minute; a quicker time, in which about 108 steps are taken in a minute; and a still quicker time, called also wheeling time, at the rate of 300 feet in the same period. —A march is also a piece of military music intended to accompany and regulate the footsteps of soldiers. Marches are of very different movements, some being quick and others slow, and were originally adapted to inflatile and pulsatile instruments. They are now written for every kind of instrument, and are found in great variety in the works of modern composers; as the funeral marches of Handel, Beethoven, and Chopin, the peasants' march in Weber's *Freischütz*, the *Fest* or "Coronation" march in Meyerbeer's *Prophète*, &c.

MAROH (Lat. *Martius, Mars*), the 3d month in our present calendar, consisting of 31 days. It was the first month in the early Roman calendar, and it also marked the commencement of the year among some of the Latin Christian nations till the 18th century. The English legal year began March 25, until the change of style in 1752. There is an old English and Scottish proverb: "March borrows three days of April, and they are ill."

The first, it shall be wind and weest;
The next, it shall be snaw and sleet;
The third, it shall be sic a freeze,
Sall gar the birds stick to the trees.

It is disputed whether these "borrowing days" were the last three in March or the first three in April. Dr. Jamieson explains that when they were stormy March was said to borrow them from April, that he might extend his power so much longer.

MARCH, EARL OF. See MORTIMER, ROGER.

MARCION. See GNOSTICS, vol. viii. p. 321.

MARCOMANNI (Germ., men of the marches or borders), an ancient German people of Suevic race. They appear to have originally dwelt in the regions of the Main and Neckar in S. W. Germany, whence they followed Arminius across the Rhine, on his invasion of Gaul, and afterward their own chief Maroboduus into the land of the Boii, which embraced parts of modern Bohemia and Bavaria. Having subdued that people, they established a powerful kingdom N. of the Danube, which soon became involved in

Wars with the Cherusci, and afterward with the Romans. Their longest and bloodiest war was that waged, in alliance with the Quadi, Hermundur, Narisci, and other German tribes, against the emperor Marcus Aurelius. The latter having died (180) in Vindobona (Vienna) on his last expedition against them, his son and successor Commodus hastened to conclude by purchase a shameful peace with the barbarians. In the 3d and 4th centuries the Marcomanni made some new incursions into the Danubian provinces of the Romans, but during the following great migration of northern nations they finally disappeared from history.

MARCUS AURELIUS. See **ANTONINUS**.

MARCY, WILLIAM LEARNED, an American statesman, born in Southbridge, Mass., Dec. 12, 1786, died at Ballston Spa, N. Y., July 4, 1857. He was the son of a farmer, and received his earliest education in the schools of his native town and at Leicester academy, and was graduated with distinction at Brown university, Providence, R. I., in 1808. After leaving college he removed to Troy, N. Y., where he studied law and was admitted to practice. When the war with England broke out in 1812, he was a lieutenant in a military company belonging to Troy, and with the rest of the company volunteered his services to the government, was sent among the earliest in the field to the northern frontier, and was stationed at French Mills, now Fort Covington. On the night of Oct. 22, 1812, he was sent with a detachment under command of Major Young to capture a party of Canadian militia posted at St. Regis. Lieut. Marcy led the attack, broke open himself the door of the blockhouse occupied by the Canadians, and when they surrendered received their arms. These were the first prisoners taken by the Americans on land, and their flag the first standard captured in the war. Mr. Marcy remained in service till the close of hostilities. In 1816 he was appointed recorder of Troy, from which office he was removed for political reasons in 1818. He acted with the republicans, or democrats as they were afterward called, and had voted as a republican for Gov. Clinton, but, becoming dissatisfied with his administration, had openly opposed him, and was in consequence deprived of his office. He now became editor of the Troy "Budget," a daily newspaper, which he soon made a leading organ of the democratic party. In Jan. 1821, he was appointed by Gov. Yates adjutant-general of the state militia; and in Feb. 1823, he was elected by the legislature comptroller of the state, when he removed to Albany, as the duties of the office required his residence at the seat of government. In 1829 he was appointed one of the associate justices of the New York supreme court, which office he held till Jan. 31, 1831, when he was nominated by a democratic legislative caucus for U. S. senator, and elected the next day. He took his seat in the senate in Dec. 1831, and remained in that body about two years, during which time he was chairman

of the committee on the judiciary. He resigned his senatorship in season to enter upon his duties as governor of New York, Jan. 1, 1833, to which office he was elected in 1832 by a majority of 10,000 over Francis Granger. He was reelected in 1834 by a majority of 13,000 over William H. Seward. In 1836 he was chosen for a 3d term by a majority of 80,000 over Jesse Buel. In 1838 he was the democratic candidate for the 4th time, but was defeated, and Mr. Seward was elected governor. At the expiration of his term as governor he was appointed by President Van Buren one of the commissioners to decide upon the claims of the Mexican government under the convention of April, 1839, and performed the duties of this commission till 1842. When President Polk assumed the government in 1845 he appointed Mr. Marcy secretary of war, a post whose duties, always sufficiently arduous, were made peculiarly difficult and responsible by the breaking out of the war with Mexico in the spring of 1846. His position was rendered more embarrassing by the circumstance that the two generals, Taylor and Scott, to whom the conduct of operations in the field was necessarily intrusted, were of the opposite party in politics, and soon imbibed and manifested a distrust of the good faith of the secretary which led to very unpleasant personal controversies. As a member of President Polk's cabinet Mr. Marcy's diplomatic powers were exerted to advantage in the settlement of the Oregon boundary dispute with England, and his abilities as a statesman were called into requisition upon many other questions. He supported Gen. Cass in the presidential election of 1848, and on the inauguration of Gen. Taylor retired to private life for 4 years. In March, 1853, he was appointed by President Pierce secretary of state, and in the latter part of that year he greatly distinguished himself at home and abroad by his correspondence with the Austrian government on the subject of the release of Martin Koszta by Capt. Ingraham of the U. S. navy. (See **INGRAHAM**, **DUNCAN NATHANIEL**.) Beside his Koszta letter, his state papers on Central American affairs, on the enlistment question, on the Danish sound dues, and on many other topics of national interest, exhibited his remarkable ability as a writer, statesman, and diplomatist. He retired from office on the inauguration of Mr. Buchanan, March 4, 1857, and just 4 months later died suddenly while lying on his bed reading. His conduct of the state department during President Pierce's administration added to his fame, and he left a reputation among his countrymen of all parties as a statesman of the highest order of administrative and diplomatic abilities.

MARDIN, a town of Asiatic Turkey, in the pashalic of Diarbekir, 335 m. N. W. from Bagdad; pop. about 20,000. It is situated on a rocky eminence, over 2,000 feet above the level of the sea. Near it is a Jacobite monastery, said to have a large library, containing works in 12 different languages.

MAREMME (sing. *la Maremma*), tracts of marshy country in Tuscany, the Papal States, and some other parts of middle Italy, on the Mediterranean coasts, which are extremely unhealthy from midsummer to the middle of autumn. During this period it is dangerous and often fatal to spend even a single night in the Maremma; those who do so are almost surely attacked by fever. There is nothing apparent in the air either to sight or smell to account for this insalubrity; on the contrary, the atmosphere seems to be remarkably clear and pure. The malaria does not proceed from the water of the marshes, for it is equally virulent on dry elevations. It has been attributed to unhealthy exhalations of sulphur and alum in the soil, but nothing is known with certainty of the cause or nature of the evil. In ancient times the Campagna di Roma, which is now almost deserted from the presence of the malaria, was cultivated like a garden, and was the seat of a dense population. The city of Rome itself has been invaded by the mephitic air, and the malarious fever already prevails in some of the streets. There is reason to apprehend that if some remedy is not discovered a great part of middle Italy will become uninhabitable. Efforts have been made in Tuscany to remove the evil by planting trees, but these have only partially succeeded.

MARENGO, a W. co. of Ala., bounded W. by the Tombigbee river, which unites with the Black Warrior on the N. W.; area, 975 sq. m.; pop. in 1850, 27,881, of whom 20,693 were slaves. It has a nearly level surface; the soil is very fertile, and a tract known as the "Canebrake" is considered among the most productive cotton land in the South. The productions in 1850 were 1,242,460 bushels of Indian corn, 261,080 of sweet potatoes, 14,550 lbs. of rice, and 32,295 bales of cotton. There were 19 grist mills, 4 saw mills, 27 churches, and 876 pupils attending schools. Capital, Linden.

MARENGO, a Piedmontese village on the river Bormida near Alessandria, situated on an extensive plain of the same name, where a victory was gained by Bonaparte over the Austrians under Gen. Melas, June 14, 1800. Bonaparte, having crossed the Great St. Bernard in the latter part of May and overrun a large portion of Lombardy, left Stradella, his head-quarters, on the Po, on June 12, and on the 18th entered the plain of Marengo, with the twofold object of preventing Melas, who had concentrated his forces at Alessandria, from escaping him by a march southward to Genoa, and of giving him battle if he should advance to deliver it. Encountering no enemy, he detached Desaix, just arrived from Egypt, southward on the road to Novi, to intercept any retrograde movement of the Austrians, and posted the main body of his army in separate divisions, with considerable intervals between, in and about the village of Marengo, remaining with his reserve of 4,000 men at Torre de Garofalo, some miles distant. Meanwhile Melas having decided that the only

secure way of reaching Genoa was by giving battle to the French, crossed the Bormida at daybreak on the 14th with 81,000 men and 200 pieces of cannon, and about 8 o'clock furiously assaulted the village of Marengo, occupied by two French divisions under Victor. The latter, after maintaining an unequal contest for several hours, were driven in confusion from the village, and Lannes, who had defended his position on the right behind Marengo with success, was obliged to fall back with the fugitives. At 11 o'clock, when Bonaparte arrived upon the field, the greater part of the French army was in full retreat, Victor's beaten troops being with difficulty covered by Lannes's corps drawn up in squares *en echelon*, and by the cavalry under Kellermann and Champeaux. Orders were at once sent to recall Desaix's corps, the fugitives, reanimated by the presence of the commander-in-chief, rallied behind Lannes's squares, and the advance of the Austrians was temporarily checked. Melas, supposing the victory secure, returned about 2 o'clock to Alessandria, with a considerable body of cavalry detached to watch a French division in the rear under Suchet, leaving Gen. Zach to continue the pursuit. For several hours the French with difficulty held their ground, and were beginning again to waver before the enemy, whose cavalry, greatly outnumbering their own, harassed their squares by repeated charges, when at 4 o'clock in the afternoon Desaix's troops arrived upon the field and took a position on the left. Victor's and Lannes's corps were re-formed on the right, the cavalry were concentrated in front of the village of San Juliano, and immediately in their rear was planted a masked battery under the direction of Marmont. Bonaparte, feeling that the crisis of the day had arrived, rode along the front of the line, and in a brief, characteristic speech restored the confidence of his men. "Soldiers," he said, "we have now retired far enough; you know that it is always my custom to sleep on the field of battle." The troops replied with loud acclamations, and the battle commenced with renewed vigor. A formidable column of Hungarian grenadiers headed by Zach at once advanced upon San Juliano, but recoiled before the discharge from Marmont's battery; while at the same moment Desaix vigorously assaulted them from the left. By great exertions Zach succeeded in restoring order in his front, and Desaix's corps, deprived of their commander, who received a musket ball in the heart as he was leading on the advance, was momentarily checked. An obstinate conflict ensued, the result of which was long doubtful. At length Kellermann, perceiving a break in the Austrian column, charged through it with 800 heavy cavalry, recharged, and traversed it several times. The column, severed in the centre, was thrown into confusion, and while the front with Zach himself surrendered at discretion, the remainder fled across the plain toward the village of Marengo in wild confusion, dispersing in their course the reserves

which were approaching to their assistance. The rout of the Austrians now became complete, and a mingled mass of horse, infantry, and artillery pressed onward to gain the bridges which crossed the Bormida. The French, after reoccupying the positions held by them in the morning, pursued the fugitives until nightfall. The loss to the Austrians in this battle was 7,000 men killed and wounded, 8,000 taken prisoners, 20 pieces of artillery, and 8 standards. The French, who brought about 28,000 men into the field, lost also about 7,000 in killed and wounded and 1,000 prisoners. An armistice followed, by the terms of which the Austrians were allowed to retire beyond the Mincio on condition of giving up all their fortified places in Italy west of that river.

MAREOTIS, LAKE. See BIRKET-EL-MAROOT.

MARET, HUGUES BERNARD. See BASSANO.

MARGARET, queen of Navarre, or Margaret of Angoulême, born in Angoulême, April 11, 1492, died at the chateau of Odos, in Bigorre, Dec. 21, 1549. She was the daughter and eldest child of Charles of Orleans, count of Angoulême, and of Louise of Savoy. Her father died when she was in her 12th year, but she was well educated by her mother, and at the court of Louis XII. She was married in 1509 to Charles, duke of Alençon, a prince of the blood royal, but who has suffered in history, as he did at the time, by the splendor of the alliance that was made for him. The 5 years that immediately followed this marriage were passed in the duchy of Alençon; but when Margaret's brother became king of France as Francis I. (1515), she not only became attached to his court, but had a large part in the government. She was superior to her brother in ability, and her learning and wit made her the fit companion of the statesmen of those times. She spoke several languages fluently and correctly. After the defeat and capture of her brother at Pavia, in Feb. 1525, Margaret aided her mother to carry on the government for some months; but in August she went to Madrid, where Francis was then a prisoner to Charles V. Her visit was reputed to have saved his life, as he was suffering from illness and mortification, and her mind was so much stronger than his that she raised him from despair. Her warm reproaches to the emperor, because of his unchivalrous treatment of Francis, had a powerful effect even on his cold nature. She managed the negotiations that took place, and promoted the marriage between Francis and Eleanor, sister of the emperor, and queen dowager of Portugal. The duke of Alençon, her husband, died April 11, 1525. She was spoken of as a wife for Henry VIII.; but that monarch, who was then infatuated with Anne Boleyn, could have never seriously thought of marrying her. She became the wife of Henri d'Albret, count of Béarn, and titular king of Navarre, whose kingdom was held by Charles of Spain. Francis, beside bestowing a liberal portion on Margaret, pledged himself to effect

the restoration of her husband to the throne of Navarre; but circumstances baffled his purpose. Margaret was very anxious for her husband's restoration, and the subject is often mentioned in her correspondence. In 1529 she and her husband retired to the principality of Béarn, where they labored with success for the improvement of the country. Margaret also paid much attention to the government of her duchy of Alençon, and in all her relations with the people she appears to have admitted the doctrine of responsibility beyond any sovereign of her time. She sympathized with the reformers, several of whose leaders, and especially Calvin, were protected by her in Béarn against their persecutors. How far she favored the new doctrines is unknown, and it has been asserted by adherents of the old faith that she admitted, some time before her death, that she had been in error; and when dying, according to one of their number, she declared that what she had done for the reformers was owing more to her compassion than from ill will to Rome. It is certain, however, that the zealous Catholics regarded her as a heretic, and that one of her works, "The Mirror of the Sinful Soul," contains Protestant doctrines. The Sorbonne censured it, and it was denounced in other ways. Francis was told that if he wished to destroy the heretics, he must begin with the queen his sister; but, though cruel and selfish, he never would allow her to be injured, and even punished some of those by whom she had been insulted, or who had sought to poison his mind against her. Margaret was a voluminous writer, as well in verse as in prose, and one of her works, the *Heptaméron* (translated into English by Kelley), is an old French classic. It is written in imitation of the *Decamerone* of Boccaccio, but was left incomplete at her death, as it contains but 72 tales, instead of the hundred originally intended. It is so far an original work, that most of the adventures described in it are those which befell some of the author's contemporaries. Next to the *Heptaméron* is *Le miroir de l'âme pécheresse*, above mentioned. She wrote, also, many poems, dramas, poetical epistles, rondeaux, and the like, several of which have been printed, while others remain in manuscript. On the death of Francis I., in 1547, Margaret, who was much afflicted by his loss, became devout, and passed most of her time in seclusion, and solaced her mind with religious thoughts and literary pursuits. Her daughter, Jeanne d'Albret, who married Antoine de Bourbon, became the mother of Henry of Navarre, afterward Henry IV. of France, and founder of the royalty of the house of Bourbon. The best life of Margaret of Navarre is that by Martha Walker Freer (2 vols., London, 1854).

MARGARET OF ANJOU, queen of England, daughter of René, count of Provence, and titular king of Sicily and Jerusalem, and of Isabella of Lorraine, born at Pont-à-Mousson, a castle in Lorraine, March 28, 1429, died at the chateau of Dampierre, Aug. 25, 1481. Her childhood

was passed, amid many troubles that befell her family, in Italy, France, and Lorraine. Her hand was sought by the count de St. Pol and by the count de Nevers. As a Provençal princess she was well educated, and at an early period of her life manifested considerable talent. Report of her beauty having reached Henry VI. of England, from a gentleman of Anjou, who acted under the inspiration of Cardinal Beaufort, her portrait was obtained for his inspection. This decided the king's action, and commissioners were appointed to negotiate a truce with France and Burgundy, Charles VII. favoring the marriage of Henry and Margaret, with the view of making it the basis of peace between France and England. The earl of Suffolk had the chief part in the transaction on the English side, to his final ruin. Not only was no dowry asked with Margaret, but England ceded Anjou and Maine to René, who claimed them as his hereditary dominions. The war party in England, headed by the duke of Gloucester, opposed both the peace and the marriage, but the Beaufort party proved victorious; and Suffolk, who was elevated to a marquissate, was authorized to marry Margaret as Henry's proxy. This ceremony took place at Nancy in Nov. 1444. Margaret did not reach England until the next April, when her marriage took place in Titchfield abbey. In 1447 occurred the death of the duke of Gloucester, of which she has been considered guilty by some historians, but without evidence. She soon became unpopular, and the English connected the loss of their French possessions with her marriage. The York family, taking advantage of the weakness of the king, aimed to obtain the crown, which belonged to their chief by the law of descent. Margaret's only child, a son, born Oct. 13, 1453, was said by her enemies to be either the offspring of adultery, or a supposititious child. Prince Edward was born while his father was suffering from one of his fits of imbecility, and when the queen was at the head of the government. The duke of York was made protector, but on the restoration of the king's health he was dismissed, whereupon he asserted his right by an appeal to arms, and the Yorkists won the first battle of St. Albans, which restored them to power. Parliament censured the queen and her friends, but in 1456 Henry assumed his rights, and the government was virtually in Margaret's hands. Personal ill feeling between the queen and the earl of Warwick, the most powerful of the Yorkist leaders, caused a renewal of the war, and the Lancastrians were at first victorious; but the Yorkists rallied, defeated their foes, and obtained possession of the king's person, who recognized York as his successor. Margaret fled, with her son, first to Wales, and thence to Scotland. Receiving assistance from the Scotch, she returned to England, and was joined by her supporters in the northern counties. York advanced to oppose her, and was defeated and slain at Wakefield, the queen behaving with cruelty after the battle. March-

ing to London, she defeated Warwick in the second battle of St. Albans, and released her husband. The Londoners, disgusted with the ferocity of her northern troops, would not admit her into their city, but recognized York's eldest son as king, by the title of Edward IV. She retreated north, and was followed by Edward. The great battle of Towton, March 29, 1461, was fatal to the Lancastrian cause. Margaret fled to Scotland with her husband and son. Thence she went to France, in the hope of obtaining aid from Louis XI., in which she met with little success. Pierre de Brezé, seneschal of Normandy, armed in her support, and by his aid she landed in England, but accomplished nothing, and returned to Scotland. There she raised forces and invaded England, and at first obtained some successes, but only to be defeated utterly in the battle of Hexham, in 1464. She returned again to Scotland, and afterward to Flanders. After residing some time at Bruges, she took up her residence in her father's dominions, where she superintended her son's education, aided by Sir John Fortescue. She kept up her connection with her English adherents, and it is stated that she once visited England, in the dress of a priest. She visited the French court, at Tours, in 1469; and it was under the mediation of Louis XI. that a reconciliation between her and the earl of Warwick was effected in 1470, the earl having broken with Edward IV. and fled from England. The earl's youngest daughter, Anne Neville, was betrothed to the queen's son, Edward of Lancaster. The Lancastrians were for the time triumphant; Edward IV. fled to the continent, and Henry VI. regained the throne. Margaret prepared to return to England, but contrary winds delayed her purpose, and it was not until April 13, 1471, that she landed at Weymouth, accompanied by her son. Warwick, however, had been defeated and slain in the battle of Barnet, and the queen took sanctuary in Beaulieu abbey. Some of the Lancastrian leaders, who had a strong force on foot, induced her to join them. While seeking to effect a junction with their friends in Wales, the Lancastrians were assailed and defeated at Tewkesbury, May 4, 1471, by Edward IV. Margaret fell into the hands of the victor, her son having previously been slain. She was imprisoned in the tower, and afterward at Windsor and at Wallingford, until Nov. 3, 1475, when she was ransomed by Louis XI., who paid 50,000 crowns for her liberty, her father having ceded Provence to him for the purpose. She formally renounced all the rights her English marriage had given her, and resided in deep seclusion at Reculée, near Angers, one of the possessions of her father, seldom leaving that retreat. Disease in its worst form preyed upon her person, and her last days were passed in the chateau of Dampierre, where she was entertained by the kindness of its lord, to whom her father at his death had consigned her.

MARGARET OF AUSTRIA, daughter of Maximilian I., emperor of Germany. and of Mary of

Burgundy, born in Ghent in 1480, died in Brussels, Dec. 30, 1580. Before she was 3 years old she was, by the treaty of Arras, concluded between her father and Louis XI. of France, affianced to the dauphin, with a large territorial dowry. To prepare her for her future station, she was educated at the French court; but Charles VIII. broke the contract, and returned her to her father, in order that he might wed Anne of Brittany, whom Maximilian himself was seeking in marriage. This gross insult, which happened in 1494, was never forgiven by the house of Austria. In 1495 a treaty of alliance was made between Maximilian and Ferdinand and Isabella, one of the terms of which was that John, prince of the Asturias, and heir apparent of the Spanish sovereigns, should marry Margaret. Sailing for Spain in winter, the weather was so stormy that many of the vessels composing the fleet were wrecked, and that which bore the princess was in great danger of being lost; but she was so cool that she wrote her own epitaph:

*Ci gist Margot, la gentille damoiselle
Qu'a deux maris, et encore est pucelle.*

Landing in Spain in March, 1497, Margaret was married to Prince John on April 8. Their union was of brief endurance, as John died of fever on Oct. 4. In a few months Margaret gave birth to a still-born child, and in 1499 she returned to the Netherlands. She was espoused for the third time in 1501, when she became the wife of Philibert the Fair, duke of Savoy, who died without issue in 1504. She did not again marry, though at one time it was in contemplation to bestow her hand on Henry VII. of England. On the death of her brother Philip in 1506, she was made regent of the Netherlands by her father, and superintendent of the education of her nephew, afterward the emperor Charles V., and his sister Mary. She was an able ruler, and was concerned in some of the principal negotiations of that time, proving herself a vindictive enemy of France, and a zealous servant of the house of Austria. In connection with Louise of Savoy, mother of the king of France, she negotiated the treaty of Cambray, in 1529, between Francis I. and Charles V., which was called "the ladies' peace," the terms of which were most humiliating to the French. This was her last important work, as she died in the following year. Throughout her life she showed a fondness for literary pursuits, and wrote well in both prose and verse.

MARGARET OF DENMARK, called the Semiramis of the North, queen of the united kingdoms of Denmark, Sweden, and Norway, born in 1358, died in Nov. 1412. She was the 3d daughter of Waldemar III., king of Denmark, and at the age of 18 was married to Hacon, king of Norway. Upon the death in 1387 of Olaf, the offspring of this marriage, and the king of Denmark and Norway, she procured her election as queen of the former kingdom, and by skilful management soon after secured the crown of Norway. In 1388 the Swedes,

who were oppressed by their king Albert, having offered her the throne of that kingdom, she defeated Albert, who after 7 years' imprisonment was released on condition of formally resigning his crown. Thenceforth she reigned with absolute authority. When urged to secure an heir to her thrones by another marriage, she promised to designate a successor, and at the assembly of the estates of the three kingdoms at Calmar, in 1397, presented to the deputies her grand-nephew Eric as her appointed heir. On this occasion, by her eloquence and address, she procured the adoption of a fundamental law, called the "Union of Calmar," establishing a perpetual union of the three kingdoms. Eric was at the same time associated with her in the government, but he did not assume supreme authority until her death. Although holding extreme opinions on the royal prerogative, Margaret was in the main a just and magnanimous sovereign, notwithstanding that Swedish historians accuse her of duplicity and violence in her transactions with that kingdom. She insured the strict administration of justice, repressed piracies and private oppression, developed the physical resources of her dominions, and fostered commerce. Her prudence, adroitness, and resolute bearing in conducting foreign relations, proved her to be one of the most accomplished politicians of the age; and during her reign the three kingdoms reached a considerable degree of power and prosperity.

MARGARET OF PARMA, regent of the Netherlands under Philip II. of Spain, born in 1522, died in Naples in 1586. She was the natural daughter of Charles V. by Margaret Van der Genet, a lady of a noble Flemish family in Oudenarde, and received an education suited to her rank in the household of Mary, queen dowager of Hungary. When only 12 years of age she became the wife of Alessandro de' Medici, grand duke of Tuscany, a man of profligate habits, and her senior by about 15 years. Within a year of the marriage Alessandro was assassinated by his kinsman, Lorenzino de' Medici, and the young widow, upon reaching the age of 20, was united to Ottavio Farnese, then 18 years old, receiving as her dowry the duchies of Parma and Piacenza. Toward Farnese she entertained feelings little different from contempt. Her birth, her masculine bearing, her undoubted capacity and training in the astute school of Italian politics, and above all her orthodoxy in matters of religion, suggested her to Philip, when about to take his departure from the Netherlands in 1559, as a suitable person to fill the office of regent of those provinces. She arrived in the Netherlands in June, 1559, and in August entered upon the discharge of her duties. Her administration, which lasted 9 years, and witnessed the opening scenes in the great revolt of the Netherlands, was mild and beneficent in comparison with those which followed. "Upon the dark ground of succeeding years," says Motley, "the lines which recorded her history seemed written with letters of light. Yet her

conduct in the Netherlands offers but few points for approbation, and many for indignant censure. That she was not entirely destitute of feminine softness and sentiments of bounty, her parting despatch to her brother proved. "In that letter she recommended to him a course of clemency and forgiveness, and reminded him that the nearer kings approached God in station, the more they should endeavor to imitate him in his attributes of benignity. But the language of this farewell was more tender than had been the spirit of her government." She was amply pensioned by Philip, and passed the remainder of her life chiefly in Italy. Her tastes, including her love for the chase, were masculine; and in personal appearance, "she seemed," in the language of a contemporary historian, "like a man in petticoats," the illusion being heightened by a natural moustache upon her upper lip. Her death was caused by the gout.

MARGARET OF VALOIS, queen of France, born in 1552, died in Paris, March 27, 1615. She was the daughter of Henry II. and of Catharine de' Medici, and was celebrated for her beauty, her profligacy, and her talents. The third duke of Guise, Henri de Lorraine, would have married her, though aware of her vices; but she desired a crown, and agreed to become the wife of Sebastian of Portugal, a union which was prevented by the influence of Spain. In 1572 she was married to the king of Navarre, afterward Henry IV. of France, the marriage being the pretext on which the leading Protestants were assembled at Paris, to be massacred on the eve of St. Bartholomew. Her mother sought her consent to have her marriage with a heretic annulled, but this Margaret refused. There was no attachment between her and her husband, and she hated his religion. After his escape, Margaret, though not at once, was permitted to join him at Béarn, where she remained 5 years, tolerating the king's infidelities, though he would not tolerate her religion. In 1681, on the invitation of her mother, she returned to the French court. There the profligacy of her life drew upon her the condemnation of her brother, Henry III., who compelled her to return to her husband, by whom she was received with bitter reproaches. She fled from him, and took up her residence at Agen, whence she made war on him as a heretic. That place being taken in 1585, she vainly sought another asylum, and was seized and imprisoned in the fortress of Usson; but her arts made her mistress of the place, from which she drove the governor, and held it for 20 years. She became queen of France in 1594, on the triumph of her husband, but he refused to restore her to freedom until she should renounce her rank, to which she would not consent until after the death of Gabrielle d'Estrees. They were divorced in 1599, but she did not recover her liberty until some years later. She visited the court in 1605, where she did homage to her successor, Maria de' Medici. The remaining 10 years of her life were passed at Paris or in its

vicinity. Almost to her last days she led a vicious life; but at length she fell into hypochondria, and was terrified at the approach of death. She founded the convent of the Petits Augustins in Paris, the inmates of which were required to have fine voices, and she instructed the children of the choir in the music she preferred. Her *Mémoires*, written by herself, are valuable because of the details they contain of the last days of the line of Valois.

MARGARIN, and MARGARIO ACID. When olive oil is cooled down to 82° F. and submitted to pressure, a solid residuum is obtained, which, when more completely separated from the oily portion after melting and slowly cooling to the temperature of 55° or 60° by a second pressing, is the substance called margarin. It dissolves in about 400 times its weight of boiling alcohol, and separates in pearly scales as the alcohol cools; whence its name, from Gr. *μαργαριτην*, a pearl. By repeated solutions and crystallizations it is rendered pure. Its composition is represented by the formula $C_{44}H_{100}O_{12}$. It is also obtained from human fat, goose grease, and other fatty substances. When saponified it yields an acid in the form of white pearly scales or fine needles, called margaric acid. This, according to Heintz, is a compound of stearic and palmitic acids, into which it may be separated.

MARGARITA, an island in the Caribbean sea, off the coast of Venezuela, to which it belongs; length about 45 m., breadth from 5 to 20 m.; area, 441 sq. m.; pop. in 1854, 23,967. It consists of two portions, connected with each other by a low and narrow isthmus. The surface is rocky and mountainous, especially toward the W., where it attains an elevation of 3,000 feet above the sea. The coast is rugged and precipitous, but is indented with excellent harbors, the chief of which, Pampatar, is a spacious basin, deep and well sheltered. The interior is fertile. It was formerly celebrated for its pearl fishery; but the pearls are now less abundant, smaller, and of inferior quality. It was discovered by Columbus in 1498, and in 1816 was the scene of a sanguinary struggle between the patriots and the Spanish troops under Murillo, which resulted in the defeat of the latter. Capital, Assumption.

MARGARITONE D'AREZZO, an Italian artist, born in Arezzo about 1215, died there after 1289, aged 77. He was essentially a painter of the Byzantine school, and attained great celebrity in Italy before the time of Cimabue. He executed many works in fresco and distemper in the churches and convents of Arezzo, of which few remains are now to be seen. His "San Francisco," however, which Vasari calls one of his masterpieces, and which is engraved in Lastri's *Etruria Pittrice*, still exists; and bears his inscription: *Margariton de Aretio pingebat*. He was more celebrated as a sculptor than as a painter, and one of his chief works, a reclining statue of Pope Gregory X., is still preserved in the cathedral of Arezzo. He superintended the building of that edifice after the designs of the

original architect, and is supposed to have designed the governor's palace in Ancona in 1270.

MARGATE, a seaport town of England, on the isle of Thanet, county of Kent, 15 m. N. E. from Canterbury, and 72 m. E. by S. from London; pop. in 1851, 9,107. The great source of prosperity is the visitors in summer, who occasionally number, it is said, 100,000.

MARGRAVE. See MARQUIS.

MARHEINEKE, PHILIPP KONRAD, a German theologian, born in Hildesheim, May 1, 1780, died in Berlin, May 31, 1846. He was educated at Göttingen, where he was appointed *repentent*, and subsequently became university preacher; in 1806 he became extraordinary professor of theology at Erlangen; in 1809 ordinary professor at Heidelberg; and in 1811 ordinary professor at Berlin, and pastor of the church of the Trinity. The first edition of his *Grund-
lehren der christlichen Dogmatik*, which was founded on the philosophy of Schelling, appeared in 1819. He represented "the evolutions of religion-in the doctrine and worship of the church as the theses of history, the world and secular affairs as the antitheses, above both of which hovers sublime and unmoved the auto-thesis God, whose recognition in all its processes and relations constitutes the principle of history." The second revised edition (Berlin, 1827) was adapted to the Hegelian philosophy, and was thoroughly recast. His most important historical work is the *Geschichte der Deutschen Reformation* (4 vols., Berlin, 1816-'84), which reproduces many documentary records, and abounds in brief and profound characterizations of men and events. In his *Christliche Symbolik* (3 vols., Heidelberg, 1810-'14), and his *Institutiones Symbolicae* (8d ed., 1830), he took a historical and comparative rather than dogmatic view of the principal Christian creeds. The practical results of his aim to demonstrate the unity and harmony of the Scriptures, the church, and the reason appear in his *Entwurf der praktischen Theologie* (Berlin, 1837). He published several volumes of minor writings and sermons, was one of the editors of the works of Hegel, and was prominent in the doctrinal controversies of his time, especially in those excited by the *Symbolik* of Möhler, and by the mystical tendencies of Görres, both of whom he opposed.

MARIA CHRISTINA, queen dowager of Spain, born in Naples, April 27, 1806. Her father was Francis I., king of Naples, and her mother Maria Isabel, daughter of Charles IV. of Spain. The late king of Naples was her brother, and the duchess of Berry is her step-sister. Her elder sister Louisa Carlotta, who lived in constant warfare with her husband, the Spanish infante Francisco de Paula, prevailed upon her to become the 4th wife of the infante's brother, Ferdinand VII. of Spain. Maria Christina's marriage with him took place at Madrid in 1829, to the great consternation of the Carlists, whose hope that the childlessness of the king would secure to Don Carlos the succession to the throne was prostrated by the

restoration on March 29, 1830, of the law by which the crown was made heritable by the female line. Maria Christina gave birth to a daughter, the present Queen Isabel, on Oct. 10, 1830. In 1832, when the king was supposed to be dying, the Carlists extorted from him a decree which cancelled the law of March 29 and excluded Isabel from the throne. But Louisa Carlotta, in concert with Maria Christina, foiled this attempt of the Carlists by causing the king to cancel the decree. On Oct. 1, 1832, Maria Christina, at the request of the king, took the reins of government into her own hands, and courted popularity by promulgating a general amnesty two weeks afterward. The official decree declaring the law obtained from him during his sickness null and void was issued by the king on Dec. 31, 1832, and for some time he personally resumed the conduct of affairs, but died Sept. 29, 1833. In his will he appointed Maria Christina regent and guardian of Isabel, and of a second daughter that she had borne to him in 1832, and who afterward became the wife of the duke of Montpensier, son of Louis Philippe. Maria Christina assumed the regency Oct. 2, 1833. She presently conceived a violent passion for Ferdinand Muñoz, a private soldier in the royal body guard, whose parents had a tobacco shop at Tarancon, where he was born, and which to this day is kept by his mother; and she married him secretly, Dec. 28, 1833. Meanwhile she more and more lost ground with the people, partly on account of her subserviency to the *moderado* party and to France, to which policy she was instigated by her ministers Martinez de la Rosa and Toreño, but chiefly owing to her clandestine relations with Muñoz. The new charter which she had granted was far from giving satisfaction to the provinces, which revolted. In the night of Aug. 13, 1836, a regiment of the provincial militia entered her palace of La Granja near Madrid, and after being joined by a corps of the guards stationed in the palace, they compelled the queen regent to dismiss her ministers and swear to the constitution of 1812; and a new constitution was promulgated, June 18, 1837. Her position, however, continued precarious. The ministers Toreño, Zea Bermudez, Martinez de la Rosa, and Isturiz, who were successively at the head of affairs, were unable to restore her popularity. This received the greatest blow from her decree, issued June 15, 1840, in obedience to French influence, which put an end to the old municipal liberties of Spain. The people rushed to arms, and she abdicated on Oct. 10 in favor of Espartero as regent, and repaired to Paris. After the downfall of Espartero, she return to Madrid in 1843. On Oct. 13, 1844, she celebrated her marriage with Muñoz in public, on which occasion she created him duke of Rianzarea. After the declaration of the majority of Isabel, she continued to intermeddle in public affairs until 1854, when she was expelled from Spain by a new revolu-

tionary movement. She retired with her husband and the 10 children she had borne him to France, where she had purchased the chateau of Malmaison.

MARIA DE' MEDIOI, queen of France, daughter of Francis I., grand duke of Tuscany, and of the archduchess Johanna of Austria, born in Florence in 1574, died in Cologne, July 8, 1642. She was educated in utter seclusion, and knew nothing beyond the circle of the Florentine court, when, in 1599, her hand was asked for Henry IV. of France of her uncle, Ferdinand I., grand duke of Tuscany. Her marriage with Henry had been contemplated 7 years before; though but for the interposition of Philip II. of Spain she would have married the duke of Parma. Rudolph II., emperor of Germany, had thought of marrying her, or of giving her in marriage to whichever of the archdukes should be chosen to succeed him. Her health and beauty declined, and she had become almost a middle-aged woman, according to Italian reckoning, when she was wedded to Henry IV. In 1601 she gave birth to the first dauphin who had been born since 1543, in the person of the prince who became Louis XIII. Maria had great cause to complain of the infidelities of her husband, though her own character has not escaped unblemished; and not only were her complaints loud, but on one occasion she would have struck him but for the interposition of Sully. Henry often threatened to send her back to Italy, with her favorites the Concinnis, by whom she was ruled. Her coronation did not take place until May 18, 1610, the day before her husband was assassinated. By the aid of the duke of Epernon, colonel-general of the French guard, she became regent. She got rid of Sully, and soon her government became one of the worst ever known to France. Her favorites, the Concinnis, were put to death in 1617, and she was herself exiled to Blois, her son being the chief of her enemies. She was freed from prison by Epernon, and a reconciliation was effected between her and her son. It was chiefly through the aid of Richelieu that this was done, and by the same assistance Maria maintained her ascendancy at court for some years. Becoming jealous of Richelieu, she sought to overthrow his power, but was defeated and imprisoned in 1631. Escaping to the Netherlands, she remained there until 1638, and was concerned in many intrigues against the government of Richelieu. She went to England in 1638, her daughter Henrietta Maria being queen in that country. Charles I. endeavored to prevail upon the French government to allow her to return to France, but unsuccessfully; and she became so unpopular in England that the long parliament requested her to leave that kingdom. She departed in Aug. 1641, parliament giving her £3,000, and promising her £6,000 more. Passing through Holland she reached Antwerp, and took up her residence in the house of Rubens, whose patron she had been. After residing there for some weeks, she was ordered to leave Ant-

werp, and to proceed to Cologne, where she arrived Oct. 12. Here she finally died, in a squalid chamber.

MARIA LOUISA, the 2d wife of Napoleon I., born in Vienna, Dec. 12, 1791, died there, Dec. 18, 1847. She was a daughter of the emperor Francis and of the Neapolitan princess Maria Theresa. After having discarded Josephine, and almost entirely broken the power of Francis, Napoleon I. selected her as his wife; and the marriage, which was celebrated in Paris, April 2, 1810, resulted, March 20, 1811, in the birth of a son. She retired to her native country in April, 1814, after the abdication of her husband, and did not comply with his request to rejoin him in Paris after his return from Elba. She afterward contracted a morganatic marriage with her chamberlain, Count Albert Adam of Neipperg, by whom she had several children. According to the treaty of Fontainebleau she was invested in 1816 with the government of the Italian duchies of Parma, Piacenza, and Guastalla. The revolution of 1831 compelled her to leave Parma, and she remained in Piacenza until after some time order was restored by Austrian arms. She was absent from Parma during the outbreak of June, 1847, and died in Vienna soon afterward.

MARIA THERESA, a German empress, and queen of Hungary and Bohemia, born in Vienna, May 18, 1717, died there, Nov. 29, 1780. She was the daughter of the emperor Charles VI. of Hapsburg, whose principal aim during a long reign seemed to be to secure to his heiress the succession to all the hereditary dominions of his house. By ample cessions of territory to various princes of Europe, he finally attained a general acknowledgment of the "pragmatic sanction;" and Maria Theresa, a princess of rare beauty and talents, received not only an education fitting her future condition, but was also early initiated into the secrets of state and admitted to the council of her father. She was married to Francis Stephen of Lorraine, afterward grand duke of Tuscany, and eventually German emperor under the name of Francis I., who was always glad to leave affairs of state to his consort, while he employed himself in profitable private speculations. Scarcely, however, had Charles closed his eyes (Oct. 20, 1740), when the work of his life seemed to crumble to pieces. The pragmatic sanction was disregarded, and claimant after claimant raised pretensions to the whole or parts of his possessions. The young princess saw herself surrounded by enemies; Frederic the Great of Prussia occupied Silesia; Charles Albert of Bavaria was elected emperor under the name of Charles VII.; Spain, Sardinia, and Augustus III. of Poland and Saxony threatened to enforce various claims by the power of arms; and France, which had no rights of succession of its own, was ready to support those of others. George II. of England alone proved a faithful ally; and the enthusiasm of the Hungarians for their young queen, who put herself and her

infant son Joseph under their protection at the diet of Presburg (1741), became a support powerful beyond all expectation. Frederic made peace at Breslau (1742), retaining his conquest, Silesia; but Charles VII. lost even his own dominion, Bavaria. This success of the Austrian arms, however, raised the apprehensions of Frederic, and the second Silesian war ensued (1744), France simultaneously declaring war against England. Louis XV. himself appeared on the field, and Marshal Saxe won battle after battle in the Netherlands; Frederic, too, was successful. Saxony, however, was now the ally of Maria Theresa; Charles VII. died soon after reëntering his capital Munich, and his son and successor not only renounced all his claims, but also supported the election of Maria Theresa's husband to the imperial throne of Germany (1745). Frederic, confirmed in the possession of Silesia, made peace at Dresden (1745). The war against Spain and France was continued, Marshal Saxe being victorious at Fontenay (1745), Rancoux (1746), and Laffeld (1747), while England was successful against the pretender, in the colonies, and on the seas. Elizabeth of Russia declaring for Maria Theresa, the war was favorably enough terminated by the peace of Aix la Chapelle (1748), Austria ceding Parma, Piacenza, and Guastalla to Don Philip, prince of Spain, and some districts of the duchy of Milan to Sardinia. Maria Theresa now turned her principal attention to the internal affairs of her states. Following chiefly the advice of her minister Kaunitz, she introduced numerous reforms, organized the administration, alleviated the burdens of the peasantry, abolished torture, created various institutions of learning, promoted industry and trade, and, though a zealous Catholic herself, subjected the papal bulls to the *placet regium*, and on the abolition of the order of Jesuits by the pope expelled its members from her states. In regard to Hungary, she observed a mild but slowly denationalizing policy. "Maria Theresa," says Szemere in his "Hungary from 1848 to 1860" (London, 1860), "during her long reign, by dint of royal flattery, winning manners, intermarriages of Hungarian and German families, and well calculated invitations of our principal nobles to a court exclusively German, well nigh succeeded in denationalizing the Hungarian aristocracy." The external diplomacy of Kaunitz was also active, and when he finally succeeded in gaining over with Mme. de Pompadour the court of France, in addition to the alliance of Russia and the house of Saxony, Frederic sought and obtained the alliance of England, and the 7 years' war began (1756), of which the Prussian monarch became the hero, Loudon and Daun being his most effective Austrian enemies. The war extended to almost all parts of the world, from the coast of Coromandel to Canada, and nearly all powers partook in it. The double peace of Versailles and Hubertsburg (1763) terminated it to the advantage of Prussia and England, Frederic re-

maining now undisputed master of Silesia. Two years later Francis I. died, and was succeeded in the empire by his son Joseph II., and in Tuscany by Leopold, their sister Marie Antoinette being afterward married to the future French king Louis XVI. Joseph, however, enjoyed in the hereditary states of his mother only the rights of a co-regent, though his influence generally prevailed in foreign affairs, as in the case of the annexation of Galicia at the first division of Poland (1772), and of Bukovina from Turkey (1777). The peace of Teschen (1779) terminated, according to the energetic decision of the old empress, the war of the Bavarian succession. Her death made room for the reformatory career of the ambitious and philanthropic Joseph.

MARIANA, JUAN, a Spanish historian and theologian, born in Talavera in 1536, died in Toledo, Feb. 6, 1628. He was educated at the university of Alcalá, and when 17 years of age joined the society of Jesus. In 1561 he was appointed professor of theology in the Jesuit college at Rome, where one of his pupils was Bellarmín, afterward cardinal. From Rome he was sent to Sicily to deliver an initiatory course of divinity in that island; and thence in 1569 to Paris, on a similar mission. Eminent success attended his labors in both cases; but his health failing, he passed the rest of his life at the Jesuit house in Toledo. Having been employed to examine the polyglot Bible edited by Arias Montanus at Antwerp in 1569-72, which had been denounced to the inquisition by the Jesuits, he returned a favorable opinion of it, which brought upon him the displeasure of his superiors. The unpleasantness of his position was increased by his arrangement of the *Index Expurgatorius* of 1584, and still more by his work *De Rege et Regis Institutione* (Toledo, 1599), in which he intimates that in some cases kings may be put to death. In Paris, where Henry III. had been assassinated a few years before, it was condemned to be burned by the common hangman. It aroused a violent controversy, and brought great popular odium upon the order to which Mariana belonged. In 1609 Mariana published at Cologne "Seven Theological and Historical Treatises," two of which, "On Mortality and Immortality," and "On Weights and Measures," were censured by the inquisition, the first on theological, the second on political grounds, and the author was subjected to imprisonment and penance. The work by which he is most favorably known, however, is his "History of Spain," to which he devoted the last 30 or 40 years of his life. It was written both in Latin (1592-1609) and Spanish (1601; enlarged ed., 1628), and extends from the supposed peopling of Spain by Tubal, son of Japhet, to the accession of Charles V., with a summary of later events, down to 1621, by Mariana himself. Though not always to be trusted, it is picturesque, graceful, animated, and adorned by an idiomatic richness, "in which," says Ticknor, "among Spanish prose compositions, the style of Mariana is all but unrivalled." There is an

English translation by Steevens (London, 1699). Among his other works are *Scholia Brevia in Vetus et Novum Testamentum* (Madrid, 1619), and *Discursus de Erroribus qui in Forma Gubernationis Societatis Jesu occurrunt*, published after his death (Bordeaux, 1625).

MARIANNE ISLES. See LADRONES.

MARIE, ALEXANDRE THOMAS, a French lawyer and statesman, born at Auxerre, department of Yonne, Feb. 15, 1795. In 1842 and again in 1846 he was elected a member of the chamber of deputies for the 5th arrondissement of Paris, his election having been chiefly due to the popularity which he had gained at the bar by his defence of political offenders. On Feb. 24, 1848, he zealously opposed the project of a regency, and advocated the establishment of a provisional government, of which he became a member as minister of public works. In this capacity he organized the famous *ateliers nationaux*, but more from necessity than from real socialistic conviction, as he personally belonged to the moderate class of republicans. He was elected to the constituent assembly by a great majority, and became a member of the executive committee. After the insurrection of June he was made president of the assembly. On July 15 he was called upon by Gen. Cavaignac to join his administration as minister of justice. Previous to the election of Louis Napoleon to the presidency of the French republic Marie was inclined to conservative measures, and voted for the prosecution of Louis Blanc and Causidière, against the abolition of capital punishment, and against other progressive measures. But subsequently to that event he adopted more liberal views, opposing the siege of Rome, and generally combating the policy of the new government. He was not reelected to the legislative assembly in 1849, and has since devoted himself exclusively to the practice of his profession.

MARIE AMÉLIE, queen of the French, born at Caserta, near Naples, April 26, 1782. Her father was Ferdinand I., king of the Two Sicilies, and her mother Maria Carolina, archduchess of Austria. One of her sisters was Maria Theresa, the empress of Francis of Austria, and another was grand duchess of Tuscany. In 1798, when Naples was invaded by the French, she retired with her mother to Palermo, spent several years in Vienna, and returned to Naples in 1802, but along with the other members of the royal family was soon again compelled to leave the capital. While at Palermo with the court she became acquainted in 1808 with Louis Philippe, whose wife she became, Nov. 25, 1809, the marriage being celebrated in the royal chapel. Henceforward sharing the destinies of her husband, she resided with him at the chateau of Neuilly in 1820, where, during his temporary absence, she received M. Thiers and Ary Scheffer, who came to urge upon Louis Philippe the acceptance of the crown. Louis Blanc says in his "History of Ten Years:" "While M. Thiers was unfolding the purport of his message, great uneasiness was depicted on the austere count-

nance of the duchess; and when she learned that it was proposed to convey into her family a crown snatched from the head of an old man who had always proved himself a faithful kinsman and generous friend: 'Sir,' said she, addressing M. Scheffer, with an emotion full of true greatness, 'how could you possibly take upon yourself such a commission? That M. Thiers should have done so does not so much surprise me: he does not know us well; but you who have been admitted to our intimacy, who have had opportunities of appreciating us—ah! we can never forgive you this.' The arguments of the two negotiators were not of a nature to move the humble and pious soul of the duchess of Orleans, but they found acceptance with her sister-in-law, Mme. Adelaide." After the accession of her husband to the throne, Marie Amélie devoted herself exclusively to domestic life, where she was remarkable for virtues, accomplishments, and piety. Sharing the flight of her husband in Feb. 1848, she retired with him to Claremont, near London, taking the title of countess of Neuilly, and there she still resides. She has survived three of her children, the princesses Marie and Louise and the duke of Orleans; also her husband, who died in 1850, and two of her daughters-in-law, the duchess of Nemours (died 1857) and Helena, duchess of Orleans (died 1858). Her remaining children are the prince de Joinville, the dukes de Nemours, Montpensier, and Aumale, and the princess Clémentine, who married the prince Augustus of Saxe-Coburg-Gotha. The late king of Naples was her nephew; she is also the aunt of the duchess of Berry, of Maria Christina of Spain, of the ex-grand duchess of Tuscany, and of the empress of Brazil. Few royal ladies have commanded such universal feelings of respect as this venerable woman, who spends her latter years in the zealous practice of religious duties and charities, surrounded by a number of her children and grandchildren, and having but little social intercourse excepting with the members of the royal family of England and a few select friends.

MARIE ANTOINETTE, JOSÉPHINE JEANNE DE LORRAINE, queen of France, daughter of Francis I., emperor of Germany, and Maria Theresa, born in Vienna, Nov. 1, 1755 (the day of the famous earthquake at Lisbon), guillotined in Paris, Oct. 16, 1793. In her youth, her teacher of Italian was Metastasio; of music, Gluck; and of French, the abbé Vermond. Her grace and dignity of person were adorned by the variety of her attainments. From an early age she had been contracted in marriage, and as soon as she reached her 15th year (1770) her hand was demanded by Louis, then dauphin, and afterward king of France. In surrendering her daughter to him, Maria Theresa wrote that, as she had ever been the delight of her mother, so she would prove to be the happiness of her husband. All the way from Vienna to Compiègne, where she first met her future husband, she was conducted by the dignitaries of France,

who had been sent to her as an escort, and her progress was a kind of triumphal procession. Married May 16 of the same year, at Versailles, the event was celebrated with all the pomp and parade which marked the luxurious court of Louis XV. Yet it was a topic for observation at the time that a series of sinister omens seemed to attend all these festivities. Shortly after the nuptials a thunder storm of unprecedented violence filled Versailles with terror. During the preparations for the magnificent fêtes at Paris which followed, a scaffolding erected for the fireworks suddenly gave way, and 60 persons were killed and nearly 800 seriously wounded. The kindness displayed by Marie Antoinette toward the sufferers won for her the quick hearts of the French. She became thenceforth for a while an idol of the people. After the birth of one of her sons, as she repaired to the services of the church, the populace desired to unharness her horses and themselves draw her carriage; and when she refused this homage, choosing rather to alight and walk, they surrounded her in crowds, and rent the air with their acclamations. It is to this period that Burke refers, when he speaks of her as "glittering like the morning star, full of life, and splendor, and joy." In 4 years the death of Louis XV. made her husband king as Louis XVI., and herself queen. One of her first acts after her elevation evinced the magnanimity with which she had resolved to reign. An officer of the body guards, who had previously given her some cause for umbrage, fancied that it would be his duty to resign in consequence of it; but on tendering his resignation, the queen refused to accept it, saying, in imitation of a similar remark by Louis XII., that "the queen did not remember the quarrels of the dauphiness, nor should M. de Pontecoulant recollect what she had forgotten." The remission of a customary tax, also, when she came to the throne, increased her charms in the eyes of her subjects. She founded a hospital for the aged and poor, and a lying-in asylum; and she built cottages for the accommodation of the humble. Her manners were inartificial even to familiarity, and while she abhorred the flatteries of the court and persistently refused to listen to its scandal, she was yet ever gracious and kind. As described to us in contemporary memoirs, Marie Antoinette was then rather charming than handsome. Her features were not regular (says Madame Le Brun, who painted her and must have studied her face); "she derived from her family that long, narrow oval peculiar to the Austrian nation; her nose was thin, and the lips rather thick;" but her complexion was one of extraordinary brilliancy, her carriage at once elegant and easy, her figure dignified yet graceful, and her conversation replete with a mingled vivacity, benevolence, and grace. "Few approached her for whom she had not a kind, or at least a courteous word." Lord Holland, who did not see her, however, until her countenance had been somewhat disfigured by sufferings, is disposed to

doubt the rumors of her beauty, and imputes to her a total want of judgment and temper. It is certain, whatever her qualities of person and deportment, that they did not commend her to the vain and voluptuous people who had been educated in the time of Louis XV., or whose plans of aggrandizement had been disconcerted by her advent. She was accused by pretended friends of too open a disregard of the prescribed exigencies and the etiquette of her rank; while more open enemies insinuated darkly of walks at early dawn with the young duke of Chartres, of stolen visits to the opera in a fiacre, and of incognito conversations, under the veil of night, with clerks of the departments. But a greater cause of crimination grew out of her undissembled interest in politics, and the use of her power over the king and her brother Joseph of Austria to control, as it was alleged, the negotiations of the two nations. There were strong parties in France eager to foment the general jealousy of Austrian influence. Pamphlets were published which did not scruple to charge her with reckless extravagance, a licentious levity, and enmity to France. The extraordinary incident of the diamond necklace, which exposed her to the suspicion of a base intrigue with Cardinal de Rohan, and was made the subject of a legal inquest, added fuel to the flame of private and public calumny already kindled. When the states-general assembled in 1789, she attended it only to receive the homages of a few and the indignities and menaces of the many, so far was her prestige and consideration already lost. The political agitations of France, which had been growing for centuries, now broke forth into open revolution. In the fearful excitement of the times, the injurious reports against her in the court were carefully cherished by the people. She was held responsible in the minds of many for the vacillation of her husband, the incapacity of ministers, the degeneracy of society, the absolute and inevitable course of events. Nor did her own conduct, often haughty and imperious, more often thoughtlessly imprudent, tend to allay the effervescence of which she was the cause. It was her fatality that nearly all her interventions in the affairs of the state, however well intended, were unhappy. The daughter of a great empress, and wife of a powerful king, trained in all the sentiments of her exalted position, she was but ill qualified to adjust questions as to the relative rights of monarch and subjects, when those subjects were in a state of frenzied revolt. Appearing with her husband at the famous banquet given at Versailles, Oct. 1, 1789, by the body guards to the officers of the garrison, in which the national cockade was said to have been trampled in the dust, she was identified with the insult in the popular resentment. On the 8d this imprudent banquet was repeated. On the 4th Paris was in an uproar. On the 5th a tumultuous mob, consisting in great part of intoxicated and frantic women, rushed from Paris to Versailles to assail the royal palace

with clamors for bread and vengeance. They broke into the palace, where two life guards, defending the apartments of the queen, were slain; the queen took refuge in the king's chamber; and the most terrifying confusion reigned everywhere till Lafayette, with a body of grenadiers, succeeded in quelling the tumult. A cry was then raised that the king should go to Paris; he appeared upon the balcony and was received with plaudits; Marie Antoinette appeared amid an ominous silence, when Lafayette, stooping to kiss her hand, discharged the wrath of the mob into a volley of cheers. On the afternoon of the 6th the royal family went to Paris, surrounded by the motley crew of insurgents, who all the way sang their revolutionary songs and shrieked their wild rallying cries. It is not true, however, as is commonly reported, that they bore on pikes before the queen the heads of the two guardsmen who had been slain. In June, 1791, when her husband attempted to escape from France, she accompanied him, refusing, as she had constantly done in every emergency, to abandon his person or cause. They were arrested at Varennes and brought back to the Tuileries. When the committee of the constituent assembly demanded an explanation of the attempt, she replied that whither her husband wished to go it was her duty and pleasure to follow. Their subsequent residence at the Tuileries was scarcely more than a continued imprisonment. For a short period they were permitted to reside at St. Cloud, where the king opened negotiations with Mirabeau, at the instigation of the queen, in the hope of composing the troubles in the state by the aid of that powerful tribune; but the death of Mirabeau shortly afterward defeated what could have been at best but an impotent endeavor. The fanaticism of revolution was on the eve of the reign of terror. Louis XVI. was adjudged guilty of tyranny, and condemned to death (Jan. 17, 1793). During his trial Marie Antoinette preserved the utmost firmness and composure. Conveyed to the Temple, she endured the privations of her position, not stoically, but resignedly, devoting her time to the consolation of her family. On Jan. 21, 1793, her husband was executed, and his death was the prelude of her own. The convention, having decreed that she should be tried, ordered her separation in captivity from her son. At 2 o'clock of the morning of Oct. 14 she was summoned to the tribunal. The trial was a mockery of justice. Her replies to the numerous questions addressed to her, some of them in the grossest degree indelicate, were temperate, clear, and firm. When asked why the sentence of death should not be pronounced against her, she disdained the expression of any complaint, reproach, or justification. Marie Antoinette had often been imprudent, often vain and frivolous, often perhaps too tenacious of the opinions incident to her birth and rank; but in these closing scenes we can see her only as the

noble persecuted woman. The day after the close of her trial she was led to the scaffold. The interval had been passed in writing a tender letter to her sister, in prayer, and in sleep. Dressed in pure white, she was placed on a hurdle with her arms bound behind her back, and so conducted to the guillotine, which was erected on the Place de la Révolution. Wherever she passed, the windows, walls, trees, and roofs were loaded with spectators. On the scaffold she was sedate, intrepid, yet courteous. Her head fell, and the revolution, says Lamartine, "believed itself avenged when it was only the more irretrievably disgraced." Marie Antoinette had 4 children: a daughter who died in infancy; the dauphin, who died in 1789; the young Louis, who perished in the Temple in 1795; and Marie Thérèse Charlotte, who became the wife of the eldest son of Charles X.—See *Mémoires sur la vie privée de Marie Antoinette*, by Mme. Campan (Paris, 1823); *Histoire de la révolution, par deux amis de la liberté*; Buchez and Roux, *Histoire parlementaire*; Lacretelle, *Histoire de France pendant le XVIII^e siècle* (6 vols., Paris, 1850).

MARIENBAD, a watering place in Bohemia (pop. 800), within a short distance of Carlsbad, annually visited by thousands of persons, and containing a number of mineral springs, beneficial for diseases of the chest, bowels, and skin, as well as for rheumatic complaints. The waters of some of the springs, particularly that of the Kreuzbrunnen, are largely exported to foreign countries. The watering place began to be frequented about 1805.

MARIENZELL, a village in Styria, 55 m. S. W. from Vienna (pop. about 1,000), situated in a picturesque country, and celebrated for its shrine of the Virgin, which makes it the principal resort of pilgrims (100,000 a year) in the Austrian empire.

MARIETTA, the capital of Washington co., Ohio, on the Ohio and Muskingum rivers at their confluence, 104 m. S. E. from Columbus; pop. in 1850, 8,175; in 1858, 4,000. It is regularly laid out, with wide streets and neatly built houses, and contains a court house, gaol, bank, and 12 churches. The educational institutions consist of a union school, 2 academies, a lyceum, Marietta college, founded in 1835, and having in 1859 5 professors, 56 students, and a library of 15,500 volumes, and the western liberal institute, founded in 1849 under the direction of the Universalists. The town is the oldest in the state, having been settled in 1788 by New Englanders under Gen. R. Putnam, and named in honor of Marie Antoinette. It is the E. terminus of the Marietta and Cincinnati railroad. On the site of Marietta there is a remarkable group of ancient works, which are described in Squier and Davis's "Ancient Monuments of the Mississippi Valley" as consisting of "two irregular squares (one containing 40 acres area, the other about 20 acres), in connection with a graded or covered way, and sundry mounds and truncated pyramids. The town of

Marietta is laid out over them, and, in the progress of improvement, the walls have been considerably reduced and otherwise much obliterated; yet the outlines of the entire works may still be traced. The walls of the principal square, where they remain undisturbed, are now between 5 and 6 feet high by 20 or 30 feet base; those of the smaller enclosure are somewhat less. The entrances or gateways at the sides of the latter are each covered by a small mound placed interior to the embankment; at the corners the gateways are in line with it. The larger work is destitute of this feature, unless we class as such an interior crescent wall covering the entrance at its southern angle."

MARIETTE, AUGUSTE EDOUARD, a French Egyptologist, born in Boulogne, Feb. 11, 1821. He was educated at the college of Boulogne, in which he was subsequently a teacher of grammar and of drawing. He early became interested in antiquities, and his first publication, *Lettres à M. Bouillet* (Paris, 1847), was a dissertation on the names of the cities that had formerly occupied the site of Boulogne. Egyptian hieroglyphics attracted his attention, and by the aid of books he became so well versed in Egyptology that he was appointed in 1848 to a situation in the Egyptian museum in the Louvre; and in 1850, at the recommendation of the institute, he was sent by the French government on a scientific mission to Egypt. There his attention was chiefly directed to the remains of Memphis, the ancient capital, and he began a series of excavations, which, carried on with skill and energy, led to most important discoveries. Mr. Bayard Taylor, who visited him in 1851 at the scene of his explorations, gives the following account of his labors: "The loose sand, stirred by our feet, slid back into the bottom, as if eager to hide the wonders it disclosed. Pavements, fresh as when first laid, basement walls of white marble, steps, doorways, pedestals, and fragments of pillars glittered in the sun, which after the lapse of more than 2,000 years beheld them again. I slid down the side of the pit, and walked in the streets of Memphis. The pavement of bitumen, which once covered the stone blocks, apparently to protect them and deaden the noise of horses and chariots, was entire in many places. Here a marble sphinx sat at the base of a temple, and stared abstractedly before her; there a sculptured cornice, with heavy mouldings, loomed against the walls of the chamber into which it had fallen; and over all were scattered fragments of glazed and painted tiles and sculptured alabaster. I asked M. Mariette what first induced him to dig for Memphis in that spot, since antiquarians had fixed upon the mounds near Mitrahenny (a village in the plain below, and about 4 miles distant) as the former site of the city. He said that the tenor of an inscription which he found on one of the blocks quarried out of these mounds, induced him to believe that the principal part of the city lay to the westward, and therefore he commenced excavating in the near-

est sand hill in that direction. After sinking pits in various places, he struck on an avenue of sphinxes, the clue to all his after discoveries. Following this, he came upon the remains of a temple, probably the Serapeum or temple of Serapis mentioned by Strabo, and afterward upon streets, colonnades, public and private edifices, and all other signs of a great city. The number of sphinxes alone, buried under these high sand drifts, amounted to 2,000, and he had frequently uncovered 20 or 30 in a day. He estimated the entire number of statues, inscriptions, and reliefs at between 4,000 and 5,000. The most remarkable discovery was that of 8 colossal statues, which were evidently the product of Grecian art. During 18 months of assiduous labor, with but one assistant, he had made drawings of all these objects and forwarded them to Paris. The man's appearance showed what he had undergone, and gave me an idea of the extraordinary zeal and patience required to make a successful antiquarian. His face was as brown as an Arab's, his eyes severely inflamed, and his hands as rough as a bricklayer's. The space explored by M. Mariette is about a mile and a half in length, and somewhat more than half a mile in breadth. He was then continuing his excavations westward, and had almost reached the first ridge of the Libyan hills, without finding the termination of the ruins. The magnitude of his discovery will be best known when his drawings and descriptions are given to the world. A few months after my visit, his labors were further rewarded by finding 18 colossal sarcophagi of black marble; and he has recently added to his renown by discovering an entrance to the sphinx." His latest discovery (1860) is a tomb at Thebes of a queen never before opened, containing ornaments and other objects of great interest and value. M. Mariette has published the result of his researches at Memphis in a pamphlet entitled *Choix de monuments et de dessins découverts ou exécutés pendant le déblayement du Serapeum de Memphis* (Paris, 1856). This pamphlet is intended only as a specimen of a more elaborate work upon which he is engaged.

MARIGNANO, or MARIGNAN. See MELIGNANO.

MARIGOLD, the usual name of certain showy garden flowers, of which the common marigold (*calendula officinalis*, Linn.) is a familiar instance. They belong to the natural order of *composita*, and are conspicuous from a certain kind of beauty during the warmest season of the year. The flowers have been rendered double in cultivation, by the outer or ray florets increasing in undue proportion over the inner or disk florets. The common marigold was once used in cookery, imparting a flavor to soups and broths, and thus has long had a place in the kitchen garden. It was formerly, among other uses, employed as a carminative; and its dried florets were used to adulterate saffron, and by dairy maids to impart a rich color to their cheese and butter. There are lemon-

colored varieties, but the usual color is a rich orange yellow. Both the single and double flowered kinds are employed for border plants; but the double sorts are preferable. The small Cape marigold (*C. phurialis*, Linn.) has pretty white flowers, which are of a brownish tint beneath. Its specific name is derived from its blossoms closing on the approach of a shower. A few species of the genus *calendula* are found native of the S. of Europe and Asia, but the greater number of them belong to the Cape of Good Hope.—Some species of annual *tagetes* are known in the gardens as French and African marigolds, and possess some claim to beauty. The former (*T. patula*, Willd.) is cultivated in Japan and China, and in many parts of India, but does not appear to be a native of those countries. Some varieties with superbly striped petals are known to florists. The latter (*T. erecta*, Willd.) varies somewhat in the color of the flowers, also in having the florets curiously quilled. The more double the flowers, the more are they esteemed; but unless care is taken to preserve seed from the choicest kinds, the plants will soon degenerate. The odor of the *tagetes* is peculiar and repulsive; but there is a South American species called the sweet-scented (*T. lucida*, Willd.), and of a different style of inflorescence. The different sorts are readily raised from seeds, sowing in June in the open ground or earlier in hotbeds, and transplanting when 5 or 6 inches high.—On the alluvial banks of rivers, from Illinois southward, is an American plant belonging to this same group, known as the fetid marigold (*dysodia chrysanthemoides*, Lagasca), furnished with pellucid glands, which give out a strong odor; the flower heads are terminal and the flowers yellow. Several composite-flowered plants growing in wet places throughout the United States, with showy yellow blossoms, are called burr marigolds, and are species of the genus *biden*.

MARIN, a W. co. of Cal., bordered on the E. by the bays of San Pablo and San Francisco, and on the S. and W. by the Pacific ocean; area, 700 sq. m.; pop. in 1858 estimated at 3,800. The surface is rugged and mountainous, and but a small portion of the soil is adapted for cultivation. The valleys are highly productive. The productions in 1859 were 21,840 bushels of wheat, 56,800 of barley, 180,000 of oats, 124,000 of potatoes, 210,000 lbs. of butter, and 150,000 of cheese. Capital, San Rafael.

MARINER'S COMPASS. See COMPASS.

MARIO, GIUSEPPE (marquis de Candia), an Italian singer, born in Turin in 1810. He received an excellent musical education, and in 1830 entered the Sardinian military service. Having been exiled to Cagliari for certain youthful indiscretions, he resigned his commission; but upon the refusal of government to accept his resignation, he escaped to Paris, and by his admirable tenor voice soon attracted attention in the musical saloons of that city. For the sake of satisfying his creditors, he accepted

an engagement at the French opera at a liberal salary, assumed the name of Mario, and, after two years' study at the conservatory, made his début in Dec. 1838, in *Robert le diable*, with decided success. In the succeeding year he sang with Rubini at the Italian theatre, and formed one of that brilliant galaxy of singers then upon the stage, comprising Rubini, Lablache, Malibran, Sontag, Persiani, and Grisi, of all of whom, with the exception of the two last named, he is at present the survivor. Since that period he has been constantly before the public, and now occupies the position of the first tenor singer upon the stage. After performing principally in London and Paris, he visited Russia in 1845, remaining there 5 years, and has during the last 10 years sung in London in the spring and summer and in Paris in the winter. In 1854-'5 he accompanied Grisi, with whom he has lived for many years and by whom he has a family of children, on an operatic tour through the chief cities of the United States. As a singer he is distinguished by a voice of great purity and sweetness, by a graceful vocalization, and by an excellent method. He possesses respectable dramatic abilities, and excels in the performance of parts like Almaviva in the "Barber of Seville." Among the operas in which he has principally appeared are *Tancredi*, *La gazza ladra*, *Cenerentola*, *Moise*, and others by Rossini; *La Sonnambula*, *Norma*, and *I Puritani*, by Bellini; *Lucia di Lammermoor*, *La Favorita*, *Lucrezia Borgia*, *Don Pasquale*, &c., by Donizetti; and *Ernani*, *La Traviata*, and *Il Trovatore*, by Verdi. In 1859 he appeared in London and Paris in the part of Don Giovanni, in the opera of that name, transposed to suit his voice.

MARION, the name of counties in 15 of the United States. I. A N. W. co. of Va., drained by the Monongahela river and its branches; area, 275 sq. m.; pop. in 1850, 10,552, of whom 94 were slaves. It has an undulating surface, with considerable woodland, and a fertile soil. Coal and iron ore abound. The productions in 1850 were 48,469 bushels of wheat, 167,071 of Indian corn, 1,096 lbs. of tobacco, and 84,916 of wool. There were 17 grist mills, 11 saw mills, 21 churches, and 720 pupils attending schools. Value of real estate in 1856, \$2,662,902; increase since 1850, 30 per cent. The Baltimore and Ohio railroad intersects the county, passing through the capital, Fairmount. II. An E. district of S. C., bordering on N. C., and drained by the Great and Little Peedee; area, 1,200 sq. m.; pop. in 1859, 21,500, of whom 9,500 were slaves. The surface is level and the soil moderately fertile. The productions in 1850 were 476,718 bushels of Indian corn, 151,482 of sweet potatoes, 518,825 lbs. of rice, and 8,680 bales of cotton. There were 21 grist mills, 20 saw mills, 84 churches, and 400 pupils attending schools. The Wilmington and Manchester railroad intersects the district, passing through the capital, Marion Court House. III. A W. co. of Ga., drained by tributaries of the

Chattahoochee and Flint rivers; area, 482 sq. m.; pop. in 1859, 7,191, of whom 3,459 were slaves. The surface is undulating and the soil generally fertile. The productions in 1850, since which its limits have been reduced, were 838,904 bushels of Indian corn, 81,870 of sweet potatoes, and 7,149 bales of cotton. There were 4 grist mills, 8 saw mills, 1 woollen factory, 29 churches, and 596 pupils attending schools. The Muscogee railroad crosses the N. W. corner of the county. Capital, Buena Vista. IV. A central co. in the peninsula of Fla., bounded S. W. by the Withlacoochee and intersected by the Ocklawaha; area, 8,100 sq. m.; pop. in 1850, 8,888, of whom 1,269 were slaves. The surface is level and the soil fertile. There are numerous lakes, of which the largest are Lakes Orange, Bryant, and Ware. The productions in 1850 were 21,425 lbs. of rice, 701 bales of cotton, 508 hhd. of sugar, and 81,625 galls. of molasses. Capital, Ocala. V. A N. W. co. of Ala., bordering on Mississippi, drained by branches of the Tennessee, Tombigbee, and Sipsey rivers; area, 1,050 sq. m.; pop. in 1850, 7,888, of whom 908 were slaves. The surface is uneven and the soil generally fertile. The productions in 1850 were 91,495 bushels of Indian corn, 39,648 of sweet potatoes, 7,825 lbs. of rice, and 1,552 bales of cotton. There were 8 grist mills and 4 saw mills. Capital, Pikeville. VI. A S. co. of Miss., bordering on La., drained by Pearl river and Black creek; area, 1,224 sq. m.; pop. in 1850, 4,410, of whom 2,195 were slaves. It has an undulating surface, and a fertile soil on the borders of the streams. The productions in 1850 were 180,504 bushels of Indian corn, 62,465 of sweet potatoes, 184,540 lbs. of rice, and 1,411 bales of cotton. There were 20 grist mills, 3 saw mills, 5 tanneries, 6 churches, and 182 pupils attending schools. Capital, Columbia. VII. A N. co. of Ark., bordering on Mo., drained by White river and its branches; area, 650 sq. m.; pop. in 1854, 8,719, of whom 159 were slaves. It has a hilly surface and fertile soil. It contains lead ore, and a variegated marble is found in the W. part. The productions in 1854 were 205,570 bushels of Indian corn, 8,400 of wheat, and 17,480 of oats. Capital, Yellville. VIII. A S. co. of Tenn., bordering on Ala. and Ga., and intersected by the Tennessee and Sequatchie rivers; area, 600 sq. m.; pop. in 1850, 6,814, of whom 551 were slaves. The surface is hilly and broken, being traversed by ridges of the Cumberland mountains. The productions in 1850 were 468,294 bushels of Indian corn, 56,965 of oats, 27,980 of sweet potatoes, and 6,538 lbs. of tobacco. There were 60 grist mills, 4 tanneries, 20 churches, and 1,120 pupils attending schools. Capital, Jasper. IX. A central co. of Ky., drained by the Rolling fork of Salt river; area, 804 sq. m.; pop. in 1850, 11,765, of whom 3,086 were slaves. The surface is hilly and the soil generally fertile. The productions in 1850 were 1,001,919 bushels of Indian corn, 218,819 of oats, 16,450 lbs. of tobacco, and 38,568 of wool. There were 15 churches, and 1,578

pupils attending schools. Capital, Lebanon. X. A central co. of Ohio, drained by the Scioto, Little Scioto, and Whetstone or Olentangy rivers; area, 384 sq. m.; pop. in 1850, 12,618. It has a level surface and fertile soil. The productions in 1850 were 32,806 bushels of wheat, 559,794 of Indian corn, 99,937 of oats, and 126,595 lbs. of wool. There were 4 grist mills, 8 saw mills, 2 iron foundries, 1 woollen factory, 3 tanneries, 12 churches, and 2,800 pupils attending schools. The Bellefontaine and Indiana railroad intersects the county, passing through the capital, Marion. XI. A central co. of Ind., drained by the West fork of White river and by Eagle and Fall creeks; area, 360 sq. m.; pop. in 1850, 24,108. It has a nearly level surface and fertile soil. The productions in 1850 were 1,123,860 bushels of Indian corn, 110,334 of wheat, 89,318 of oats, and 51,193 lbs. of wool. There were 28 grist mills, 41 saw mills, 2 woollen factories, 3 cotton factories, 4 tanneries, 99 churches, and 5,156 pupils attending schools. A number of railroads concentrate in the capital, Indianapolis. XII. A S. co. of Ill., drained by Skillet fork of Little Wabash river and several creeks; area, 579 sq. m.; pop. in 1850, 6,720; in 1855, 10,189. It has an undulating surface and fertile soil. The productions in 1850 were 5,818 bushels of wheat, 418,335 of Indian corn, 71,557 of oats, and 22,116 lbs. of wool. There were 16 grist mills, 8 saw mills, 2 woollen factories, 2 tanneries, 9 churches, and 688 pupils attending schools. The Illinois central and the Ohio and Mississippi railroads intersect the county, the latter passing through the capital, Salem. XIII. A N. E. co. of Mo., separated by the Mississippi from Ill., and drained by North and South Fabius and North Two and South Two rivers; area, 425 sq. m.; pop. in 1856, 18,144, of whom 2,649 were slaves. It has an undulating surface, mostly prairie; the soil is very fertile. The productions in 1850 were 105,841 bushels of wheat, 663,658 of Indian corn, 65,884 of oats, and 39,988 lbs. of wool. There were 15 grist mills, 9 saw mills, 7 tanneries, 23 churches, and 1,496 pupils attending schools. The Hannibal and St. Joseph railroad intersects the county, passing through the capital, Palmyra. XIV. A S. central co. of Iowa, intersected by the Des Moines river; area, 576 sq. m.; pop. in 1859, 16,167. The surface is undulating, with much prairie, and the soil fertile. The productions in 1859 were 80,325 bushels of wheat, 4,688 of oats, 729,173 of Indian corn, 7,628 tons of hay, 25,849 lbs. of wool, 220,820 lbs. of butter, and 17,536 galls. of sorghum molasses. Capital, Knoxville. XV. A W. co. of Oregon, bounded W. by the Willamette river, and watered by the N. Santiam and other branches; area, about 1,200 sq. m.; pop. in 1858, 7,418. Toward the E. the surface is mountainous; the soil in the W. is fertile. The productions in 1850 were 86,165 bushels of wheat, 24,172 of oats, 15,224 of potatoes, and 3,098 lbs. of wool. Taxable property in 1858, \$2,299,709. Capital, Salem.

MARION, a village, and the capital of Perry co., Ala., on the Alabama river, 28 m. S. E. from Selma; pop. in 1860, about 2,500. It is connected with Selma by a branch of the Alabama and Mississippi rivers railroad, and another railroad, now in progress of construction, will connect it with Cahawba. It has 5 churches, 8 newspapers, and a monthly magazine, and is the seat of Howard college (controlled by the Baptists), 2 large female seminaries, St. Wilfrid's academy for boys, and a number of flourishing private schools.

MARION, FRANCIS, an American revolutionary general, born in Winypaw, near Georgetown, S. C., in 1732, died Feb. 29, 1795. He was of a Huguenot family, which emigrated from France to South Carolina about 1690. He received little education, for which the facilities in his native district were then very slight. At the age of 16 he embarked in a small vessel, with what object is not known, for the West Indies. The vessel foundered, and, though he had always seemed a weak and puny boy, he was one of the few who survived the wreck and the severities of starvation which ensued. On his return he resumed the habits of a farmer. In 1759 he was a volunteer in an expedition against the Cherokees, then occupying the whole N. and W. frontier of South Carolina, and served in a cavalry troop commanded by one of his 6 brothers. In 1760 and 1761 he was again in the field on similar expeditions. He led the forlorn hope in the battle of Etchoee, and was one of the few who escaped. The Cherokees having been subdued, he retired to private life, and does not appear again till in 1775, at the outbreak of the revolution, he was elected to the provincial congress of South Carolina from St. John's parish, Berkeley. As a civilian he made no figure, though the congress in which he sat committed the colony to the revolution. In the military organization which ensued, he was made (June 21, 1775) a captain in the regiment of which William Moultrie was colonel. This regiment became singularly efficient, and was soon required in active service. Marion's company was one of those despatched from Charleston for the capture of the British fort Johnson. The place was taken with little difficulty, and the guns promptly directed upon the men-of-war in the harbor. The British governor fled to the shipping, which was completely expelled from the harbor by the cannon from another fort established by Moultrie on Haddrell's point. Among the other fortifications was a station at Dorchester, which was confided to Marion, who was promoted in his regiment. He was soon summoned thence to the defence of the fort begun on Sullivan's island, menaced by a powerful British fleet. It was assailed before it was finished, and in the engagement (June 28, 1776) Marion greatly distinguished himself. The hostile fleet was repelled with great loss, narrowly escaping destruction, and the carnage, for the numbers engaged, was unsurpassed by that of any battle on record. In

Feb. 1777, Marion was despatched with 600 men to the defence of Georgia, where he served at intervals until the British with overwhelming forces had gained possession of the state. Fort Moultrie (Sullivan) was again confided to his charge, and he held this position during Gen. Prevost's attempt at a *coup de main* on Charleston (1779), and while the forces of the latter had possession of the neighboring islands. Subsequently he joined the united French and American forces in the attack on Savannah. He did not conceal his indignation at the course of D'Estaing in according to the British, beleaguered in Savannah, the time which they required to put themselves in a proper state of defence. The event confirmed his apprehensions, and the allies were repulsed with great slaughter. South Carolina was now left almost defenceless. The French fleet and army abandoned the coast, the regiments of the colony were reduced to skeletons, Georgia was in the possession of the enemy, and the continental army in the South was few in numbers, poorly armed, and wanting in supplies and resources of every kind. It was at this juncture that the British, with a powerful army by land and sea, assailed South Carolina and besieged its capital city. During the siege, which lasted for 6 weeks and until the garrison had exhausted their provisions, Marion accidentally broke his leg, and was therefore conveyed with all other invalids out of the city. He recovered slowly, and was obliged to conceal himself and frequently change his quarters before the advancing columns of the enemy, which overran the country. As he grew able for service, he gathered his neighbors about him, patriotic farmers and hunters, and seizing what arms could be found, rusty firelocks, swords hammered out of mill saws, knives, and hatchets, he laid the foundation of that brigade which finally became famous for its partisan successes. Meantime Gen. Gates had been despatched by congress to take command of the southern army. At the approach of the continental forces, Marion, then a colonel, joined them in North Carolina; but so wretched were his equipments, so paltry his numbers, without regimentals, ragged, and deficient in weapons, that Gates remarked only the ridicule which they provoked in the camp, and failed to appreciate their patriotism and ability. He despatched Marion on an idle mission to cut up the boats on the rivers to prevent the escape of the British. In a few days Gates was defeated in the disastrous battle of Camden (Aug. 1780), while Marion, waylaying the British guards, dispersed them and rescued their continental prisoners. Had he and his men been employed as a scouting force, this shameful surprise at midnight would have been avoided. From this period dates the long series of adventurous flights, forages, marches, countermarches, surprises, and sharp passages of war, which distinguished the brigade of Marion until the establishment of peace. Small means achieving great results; an army confronted by troopers and riflemen,

who had not a good sword upon which to rely, nor ammunition for a 3 hours conflict; patriots sustaining themselves in arms, winter and summer, in mountains and in swamps, without clothes or blankets, pay or provisions, ever assailing the enemy at any unguarded point, darting between his fortresses, snatching up his foragers, cutting off his detachments, sweeping away his supplies and baggage wagons—such were the features of Marion's warfare. He kept alive the spirit of patriotism, taught the inexperienced frontiersman how to be both bold and vigilant, how to discipline himself, and how to arm and support himself, at a time when the country had no resources for him. Meantime Marion was promoted to a brigadiership, and his command was termed a brigade whether it numbered 20 or 1,200 men. It was a peculiarity of the service under him that the men were allowed to go and come almost as they pleased. They left him, however, only for his and the public interest, storing harvests, which were immediately placed in his hands. The corn, rice, and cattle of the Carolinas were the provisions of the continentals, and the indigo crop the specie used to buy clothing and ammunition; and thus it was necessary for the brigade to be a mobile body, fluctuating in numbers, the members, whether present or absent, being busy in the common cause under the guidance of one master mind. Soon after Marion had rescued the prisoners made at Gates's defeat, he surprised and completely dispersed a crowd of loyalists and refugees under Major Gainey. Within 24 hours he encountered a second body under Col. Barfield, which he outwitted and discomfited. These and other exploits alarmed the British, and Tarleton was sent with an overwhelming force to cut off "the swamp fox," the *nom de guerre* already won by him. Baffling this superior foe by retreats, and hotly pursued, he nevertheless managed to surprise and defeat two smaller forces, performing a series of strategic manoeuvres utterly unaccountable to the British commander. The moment that Tarleton gave up the pursuit, Marion made an ineffective dash upon the garrison at Georgetown. It is impossible to pursue in detail the progress of so restless and eager a chieftain in a career marked by so great a variety of action and resource. Even popular tradition fails to follow him. His camp at Snow's island, his potato feast to the British officer, his quiet humor when dealing with both friend and foe, his perpetual vigilance and sudden and efficient movements, have all entered into the legends of the country. Though Snow's island, a natural fortress of swamps and forests accessible only under good guidance, was his favorite camp and hiding place, yet he had other retreats in almost every swamp of Carolina, where he found ready refuge from a superior enemy, and whence he could rapidly emerge upon any body of men approaching his own in numbers. His food was chiefly potatoes and corn, and of these the supply was always scanty; his only drink was vine-

gar and water; for months he slept without a blanket, and marched without a hat; and he trained his followers to his own habit of cheerful endurance. He disciplined in his style of warfare many young officers, emulous of his skill, enterprise, and successes, and proving in time worthy of their master. At Snow's island a British officer bringing despatches concerning an exchange of prisoners was conducted blindfold to Marion's camp. The bandages being removed, he was astonished at finding the redoubted partisan the smallest person in his army. His officers, generally tall and stalwart, were grouped about him. The rangers, riflemen, and troopers were scattered about in the forests. The surprise of the Englishman was increased when, being bade to stay for dinner, he found the food to consist only of a peck of sweet potatoes roasted in the ashes of a neighboring fire, and served upon a fallen log. The drink was vinegar. He commented on the poverty of the fare, and was assured that it was better than usual. "But your commissariat?" "We have none." "Your pay is good?" "I have never received a dollar for my services, nor have my people." "What motive, what stimulus have you for fighting then?" "We fight for love of liberty," &c. The legend adds that the British officer was so much impressed with the conversation, that on his return to Charleston he resigned his commission and left the service. In 1781 Gen. Greene, superseding Gates, took command of the southern army. He was able to appreciate the courage and services of Marion, who had maintained an efficient independent organization. He now joined his brigade with the main army or acted separately, as the occasion or the wishes of the continental general required. He was Greene's great resource for obtaining intelligence; had his spies in the British camps and garrisons, in Camden, Charleston, Georgetown, and Savannah; was himself almost ubiquitous with his brigade, and always able to report some satisfactory result from his enterprises. Mounting his infantry behind his cavalry, he would make his way to the vicinity of the enemy, and crush any assailant who from the rapidity of his movement supposed him to be at the head of his cavalry only. His demonstrations, even when he had no ammunition, kept the British in continual apprehensions. Attempts to overreach or entrap him, to penetrate his recesses, or to intercept him between overwhelming forces drawn from opposite quarters, were all futile. He baffled Tarleton, Barfield, Dooley, Gainey, McArthur, Coffin, and Wemyss, all of whom were in turn or in concert despatched for his express capture or defeat. Cornwallis especially urged his ruin and that of Sumter, and affirmed that the former kept the whole country in terror from the Santee to the gates of Charleston. When he meditated some enterprises in which bayonets and a regular force were necessary, Greene joined Lee's legion to his brigade. Lee had difficulty in finding him, so warily did

he change his ground after he had once made his presence felt in any quarter. With the united forces, Marion made a second attempt on Georgetown, which like the first was only partially successful. The town was taken, but the garrison had time to strengthen themselves in the fortress, which could not be overcome without artillery. Lee soon after rejoined the main army under Greene, and Marion was left to his usual operations, capturing convoys, cutting off detachments, and skirmishing with the front or rear of marching bodies which he could not assail in pitched battle. Several of his engagements, which occurred almost daily, had but partial success, because instead of bullets he had only swan and duck shot. The British denounced his mode of warfare as unchristian, since he shot down sentinels, patrols, and scouting parties without beat of drum, beside perhaps mortifying their *amour propre* by the use of duck shot. They hanged three of his men whom they captured. He promptly retaliated, a measure which caused the abandonment of the practice. Meanwhile Cornwallis had driven Greene's army out of the state. But Marion held his ground, and while the continentals were flying through North Carolina, pursued by the British general, he was pressing his predatory warfare even to the gates of Charleston, and interrupted the line of communication between the metropolis and all the parts of the interior. Col. Watson with a picked force was sent to expel or crush him. Major Gainey, of whom great expectations were formed, was also sent in pursuit; yet he was attacked and defeated by Marion, narrowly escaping with his life. Col. Tyne, whom Marion had once before defeated, was also on his track, and was again foiled. Major McIlraith, sent with another division to cooperate with Watson, was in close pursuit of him, but by a remarkable play of strategies he baffled them both, so palpably that McIlraith was disgraced. The next auxiliary of Watson was Col. Doyle, subsequently distinguished as a British general in India. Each took the field with a regiment of British, and a large additional force of loyalists. Unable openly to meet either division, Marion determined to prevent their junction. Retiring before Watson after an engagement at Wiboo swamp on the Santee, he led him on from ambush to ambush, at every covert diminishing his numbers by his rifles, until after several days the relation of the parties was reversed. Watson fled before the brigade, and after a narrow escape into Georgetown affirmed that he had never before seen such shooting. Marion then turned upon Doyle, who made a precipitate retreat and avoided him. This retreat was in part occasioned by the necessities of the main British army under Rawdon, who called in his detachments at the approach of Greene. Marion returned against Watson, who had taken the field again with new recruits, but his want of ammunition rendered him unable to fight, and his opponent was soon summoned to join Rawdon.

Being again joined by Lee and supplied with ammunition, Marion determined to attack the British post of Fort Watson on the Santee river. It was on high ground, and the garrison laughed at his efforts without artillery to harm them. At length towers, made of logs, were extemporized during the night, and raised sufficiently high to enable the riflemen to plant themselves on an elevation equal to that of the fortress; and while the sharp shooters plied their bullets, a storming party scaled the walls, and the garrison surrendered. Lee then rejoined Greene, but after the battle of Hobkirk's Hill aided Marion in investing Fort Motte on the Congaree. The besiegers again felt the want of artillery, but Mrs. Motte, the original owner of the house around which the fort had been constructed, furnished an Indian bow with arrows, which, tipped with combustibles, set fire to the roof over the heads of the garrison, which then capitulated. Marion distinguished himself by prudence and humanity superior to his times, and prevented Lee's men from hanging some of the prisoners. Some causes of complaint prompted him soon after to resign his commission and join the main army under Washington; but Greene, who could hardly have dispensed with him, succeeded in dissuading and retaining him, and he was soon repeating his exploits on the skirts of Lord Rawdon's forces. While he had captured Forts Watson and Motte, Sumter had taken the forts at Orangeburg and Granby, and thus the connections of the British general with the interior were cut off. While thus holding Rawdon in check, Marion succeeded in capturing Georgetown, an event which provided him with a much needed suit of regimentals. He subsequently joined Greene and Sumter in the pursuit of Rawdon, till he intrenched himself in Orangeburg, and declined battle. After the evacuation of Orangeburg and the departure of Rawdon for Europe, the forces of Marion and Sumter swept the country to the very gates of Charleston. He then resumed his independent command in the Santee country. One of his lieutenants, Col. Harden, was despatched on an expedition to the south between the Edisto and the Savannah, and found himself suddenly confronted by the enemy in superior force. Marion hastened to his relief, and arrived not only in time to rescue him, but so quietly that he drew the British into an ambush and severely defeated them. He returned to the continental army under Greene, then approaching the enemy at Eutaw. Leading the militia of North and South Carolina in the battle which ensued, his troops were the first in action, and delivered 17 rounds before they yielded to the bayonet. He pursued the British on their retreat to Charleston, which they still held chiefly by means of their shipping, and lay in wait for detachments sent from the city on foraging expeditions. The British were gradually confined almost to the walls of Charleston, and the legislature of the state again assembled for the purpose of restoring civil authority. It was mainly an assem-

blage of military men, among whom was Marion. The brunt of the battle fell upon him when the British attempted to surprise the American army; and after the war seemed about to cease, and the enemy to depart, a new insurrection of the tories under Major Gainey upon the Pedee drew him at full speed with his cavalry in that direction. So prompt were his measures that Gainey succumbed at once. The indulgent terms which he granted gave great offence to the more vindictive of his own followers. Returning to the region of the Santee and Cooper rivers at such speed as to break down half of his force, the British foragers disappeared before him, and he cut off a corps of negroes, called the black dragoons, which the British commander had formed in a moment of desperation. His vigilance had confined the British in Charleston, and prevented any passages of arms, before hostilities were formally terminated; and he steadily refused to engage in any unnecessary enterprise after the prospect of peace. He disbanded his brigade soon after the British fleet and army evacuated Charleston (Dec. 14, 1782), taking a tender farewell of his followers, and returned to the avocations of a farmer almost in poverty. He was subsequently returned to the senate of the state by the electors of St. John's parish, Berkeley, and gave new proofs of his unselfish patriotism. In 1784 he accepted the appointment under the state of commandant of Fort Johnson, and soon after married. In 1790 he was a member of the convention for framing a state constitution, and in 1794 he resigned his commission as one of the generals of the state militia. He was buried at Belle Isle, in the parish of St. John's, and a slight oblong tomb, the tribute of a private citizen, covers the remains of one of the purest men, truest patriots, and most adroit generals, that American history can boast.

MARIPOSA, an E. co. of Cal., drained by the San Joaquin and its branches, the Merced and Fresno, and Owens river; area, about 8,000 sq. m.; pop. in 1852, 8,969, of whom 4,583 were Indians; white pop. in 1858, estimated at 3,638. The surface is mountainous toward the E., being there traversed by the Sierra Nevada; the soil in the W. is considered to be of great fertility. Gold abounds throughout the county, being found in nearly every creek and gulch and in quartz veins. Silver ore is found at Quartzburg. The productions in 1859 were 5,600 bushels of wheat, 10,000 of barley, and 1,000 of oats. There were 5 saw mills, 32 quartz mills (cost \$380,000), and 65 m. of ditching. It contains the Yo Semite falls and the Mammoth Tree grove, for descriptions of which see CALIFORNIA. Capital, Mariposa.

MARITZA, or **MARIZZA** (anc. *Hebrus*), a large river of Roumelia, European Turkey. It rises on the N. E. flank of the Despoto-dagh, a branch of the Balkan mountains, flows S. E. and S. S. W., and after a course of 260 m., during which it passes Philopopolis, Adrianople, and Trajanopolis, enters the Grecian archipelago by two mouths.

MARIUS, **CARUS**, a Roman soldier and statesman, born in the village of Cereata, near Arpinum, in the Volscian country, in 157 B. C., died in Rome in 86 B. C. His origin was humble, and his parents are said to have been clients of the Herennii, a noble plebeian family. That he ever labored for wages may be doubted, and the story may have been one of the reports invented to injure him by the *optimates*, and accepted by him to make his elevation seem the greater by contrast with his original position. Juvenal, who wrote in the character of a Marian, or anti-oligarch, at a time when the memory of the republican contests had not entirely passed away, speaks of Marius as having been a common laborer; but he was a satirist, and was professedly contrasting the virtues of the *novi homines* of an earlier period with the viciousness of certain illustrious persons, who were of patrician families. Marius had no third name, or cognomen, nor did he ever win one, notwithstanding his brilliant military services. A passage in Velleius Paterculus, which represents him to be of equestrian birth, is believed to be an error of some transcriber. Plutarch expressly states that his parents were both poor and obscure, and that they gained their living by the labor of their hands. The first mention of him in history is as a soldier in the army with which the second Scipio Africanus took Numantia, in 184 B. C., when he was but 28 years old. His bravery, his sobriety, and the readiness with which he submitted to the severe reforms that Scipio found it necessary to introduce into the Roman army, attracted the attention and won the commendation of that great general. Scipio is even said to have pointed out Marius as one fit to succeed him, a story probably invented after Marius had risen to eminence. The tradition was, that Marius was so encouraged by Scipio's words, deeming them to form a divine intimation, that he entered on a political career; yet it was not until 15 years later that he achieved his first political success, being then chosen tribune of the people (119 B. C.). This office he obtained through the influence of Metellus; and it is added that he had long been an adherent of the Metelli, who belonged to the Cæcilian *gens*, one of the most distinguished plebeian houses in Rome. This story does not agree with that which represents him as being a client of the Herennii. He had previously been unanimously elected military tribune. As tribune of the people he introduced a bill calculated to promote the freedom of elections, which was opposed by the *optimates*, then at the height of their power, immediately after the fall of Caius Gracchus; but Marius, by the most vigorous measures, carried his point, though the opposition was headed by his patron, the consul Metellus. He showed his firmness in another way, by opposing a distribution of corn among the people, because he believed it injurious to their interests. He sought the curule ædileship, but was forced to withdraw from the contest; and

he was beaten as a candidate for the plebeian ædileship. Elected to the prætorship, his name was the lowest on the list. He was then proceeded against for bribery. This was the work of the aristocracy, and he escaped conviction only because the votes of his judges were equal. He was prætor in 115, but did not leave Italy. As proprætor, the next year, he served in Further Spain, which he is reported to have cleared of robbers. Shortly afterward he married Julia, a sister of the father of Julius Cæsar, who belonged to one of the most illustrious of the patrician *gentes*. When Q. Cæcilius Metellus took command of the Roman army employed against Jugurtha (109), Marius became one of his legates, and greatly distinguished himself in the war, being very popular with the common soldiers, and attracted the attention of his countrymen at home. He asked leave of Metellus to go to Rome, that he might offer himself as a candidate for the consulship; but his commander, after first seeking to argue against his supposed unreasonable ambition, and then attributing his refusal to the state of the service, treated his request with contempt. Marius then commenced intriguing against Metellus, whom he accused of prolonging the war, which he offered to bring to a prompt conclusion with one half the force then employed against Jugurtha. These things were all known at Rome, where they increased the popularity of Marius. To get rid of an enemy, Metellus granted him the permission he had asked, but only 12 days before the time of election. Arrived at Rome, Marius entered on the contest at once, and became consul in 107, at the age of 50. He did not bear his success with meekness, but made use of the harshest language when speaking of the aristocracy. The province of Numidia was assigned him, which made him the successor of Metellus. In levying soldiers, he did not confine himself to the classes whence the legions had formerly been recruited, but enrolled men from the lowest orders, and slaves, which is regarded as the first of those acts through which the Roman armies were led finally to look more to their commanders than to the state for law. He led his new levies to Africa, where he waged the war against Jugurtha vigorously, until the latter took refuge with Bocchus, king of Mauritania, who betrayed him to Sylla, the quæstor of Marius, which caused Sylla to claim the merit of having closed the war, and so laid the foundation of a personal quarrel destined to have memorable consequences. Marius remained two years longer in Numidia, bringing the country into order, and establishing the Roman government there. While thus engaged, he was unanimously elected consul, and without opposition, the approach of the Teutones and Cimbri, and the Ambrones, who had destroyed several Roman armies, having caused great fear in Italy, and drawn all men's minds to the conclusion that power could be intrusted to no one but the conqueror of Numidia. His Jugurthine triumph took place Jan. 1, 104, the first day of

his second consulship. Jugurtha walked in the procession, and afterward was thrown into a dungeon and starved to death. The barbarians not appearing in Italy, Marius employed the time in effecting reforms in the army, and in disciplining the newly raised troops. His discipline was severe, but the impartiality of his conduct made him a favorite with the men, who had the utmost confidence in his ability and good fortune. He was chosen consul a 3d time for the year 108. The enemy still remaining in Spain, the aristocratical party determined to oppose his reelection; but the people supported him, and he was elevated a 4th time to the consulship. This year he encountered the Teutones and Ambrones in Gaul, totally destroying them in a great battle fought near Aquæ Sextiæ, the modern Aix. Just after the battle Marius received news that he had been elected consul for the 5th time. Meantime the Cimbri, who had separated from their allies, had penetrated into Italy, where the terror of their name caused the army of Catulus, the other consul, to fly before them. Marius was recalled to Rome. Refusing the triumph offered him by the senate until the Cimbri should be conquered, he joined the army of Catulus, with which the troops who had conquered the Teutones were now united. On July 30, 101, the Cimbri were annihilated in a pitched battle, fought on a plain called the Campus Raudius, near Vercellæ, the modern Vercelli. The victory was due to Marius, though his enemies sought to give the credit of it to Catulus, who was then proconsul; but the Romans were so convinced that they owed their deliverance to the consul, that among other high honors they gave him the title of third founder of the state, thus ranking him with Romulus and Camillus. His triumph was brilliant, and Catulus was allowed to share in it. For the 6th time he was chosen consul; but the good fortune which he had experienced in the field deserted him in the city, where his ignorance of civil life led him into various mistakes, which caused his popularity to decline as rapidly as it had risen. The aristocracy had the art to place him in opposition to the tribune Saturninus, who was his instrument and associate, and whom he had to proceed against to the tribune's ruin and death. He entrapped his old enemy Metellus, by a trick, into a position that caused him to be banished. So low had Marius sunk by the time his 6th consulship was drawing to a close, that he dared not become a candidate for the censorship. The next year, 99 B. C., he visited Asia, where he sought to rouse Mithridates to make war on Rome, being conscious that he should recover his popularity when once more placed at the head of an army. He was chosen augur during his absence. After his return to Rome, he did not rise in popular esteem; he could obtain no command in the East, and Sylla, who had supplanted him in the people's favor, exasperated him by his conduct. The Mauritanian king had set up in the capitol figures showing the surrender of Jugurtha to

Sylla. Marius was making preparations to pull down these figures, and Sylla to resist him, when, in 90 B. C., the social war broke out, which threatened the subversion of the Roman power in Italy. Both Marius and Sylla had to contend against the confederate Italians in the social or Marsic war, and both did so with success. It was thought, however, that the exploits of Sylla were the more striking, but it is certain that Marius twice defeated the Marsi, the most warlike of all the allies, and whose name furnished to the Romans a title for the war. He returned to Rome after these victories, avowedly because of his inability to encounter the fatigues of the service. He had grown fat and unwieldy, and was 67 years old. After this war had been finished, the rivalry of Marius and Sylla was resumed. War against Mithridates having been commenced, Marius sought the command in the East. He frequented the Campus Martius, and went through exercises appropriate to the young, in order to show that he was equal to the fatigues of war. He failed, and Sylla was appointed to the office he sought (88). Marius now procured the passage of a law to distribute the Italian allies, who had been admitted to the Roman franchise, among all the tribes, so that they should control the old citizens. His tool was P. Sulpicius Rufus, a tribune, and he was successful, though not without having resort to violence. The Italians then conferred the eastern command upon Marius; but Sylla, who had joined the army destined to act against Mithridates, incited it to resistance, marched to Rome, and compelled Marius and his friends to fly, they having no force to send against him. Marius endeavored to raise an army by offering freedom to all slaves who should join him, but in vain. He then sought to reach Africa, but was compelled by the severity of the weather and want of provisions to land in Italy, near which he was coasting. Taking refuge in a wood, and suffering from cold and hunger, he predicted that he should yet receive a 7th consulship. He told his companions that in his childhood a nest with 7 eaglets in it had fallen into his lap, and that the soothsayers had prophesied to his parents that he should 7 times enjoy supreme power. Flying from immediate pursuit, he and his company were forced to swim to two merchant vessels, the crews of which refused to give them up, but afterward made them land at the mouth of the Liris. Here, while concealed in a thick marsh, Marius was found by his pursuers, and imprisoned at Minturnæ. A Cimbric soldier was ordered to despatch him, but lost courage, so affected was he by the majesty of the old man's appearance and language, and declared that he could not kill Caius Marius. The people of the town rose in his favor, and furnished him with a vessel, in which he sailed to Africa, meeting with many dangers on the way. He landed at Carthage, where a message was sent him by the Roman prætor, ordering him to leave the country. His answer was: "Tell the

prætor that you have seen Caius Marius a fugitive sitting on the ruins of Carthage"—a reply, says Plutarch, in which he not inaptly compared the fate of that city and his own changed fortunes. He was soon compelled to leave, and went with his son to the island of Cercina. Meantime a revolution had taken place in Italy, where the consul Cinna, who was of the Marian party, had placed himself in opposition to the Syllan faction, headed by his colleague Octavius. The latter, after a severe struggle, expelled Cinna from Rome, who raised a large army, composed of the new citizens. Marius, on hearing of this, returned to Italy, and on landing proclaimed freedom to the slaves, and sent to Cinna, offering to obey him as consul. Cinna accepted the offer, and named him proconsul. This office Marius would not accept, saying its title and insignia were not suited to one in his state. One idea, that of vengeance, alone had possession of his mind. Rome was soon compelled to surrender to the army headed by Cinna and Marius. The former was disposed to proceed mildly, but Marius had other intentions. At first he refused to enter the city until the comitia repealed the law under which he had been banished; but while the voting for that purpose was going on, he entered at the head of his guards, who were composed of the slaves by whom he had been joined, and an immediate massacre of the anti-Marians was begun. The slaughter was continued for several days, and among its victims were many of the noblest of the Romans. Cinna and Marius declared themselves consuls for the next year, 86 B. C. But though Marius had thus irregularly obtained his 7th consulship, he did not long enjoy it, dying on its 17th day, but whether from illness brought on by age, fatigue, and care, aided by dread of the future, or by suicide, is unknown. The statement that his mind was disordered by fear of Sylla's return is probably one of the libels of the Syllan party. After the triumph of Sylla, the ashes of Marius were thrown into the Anio, by order of the victor. The representative and leader, though perhaps not in strictness the founder, of the party which bears his name in the later history of the Roman republic, and which he was clearly incompetent to conduct to success, his character has probably suffered, like that of other party chiefs, at the hands of his enemies. No Roman ever rendered greater services to the state, and no Roman ever rose so high, to fall so low, with the single exception of Pompey, who in the next generation headed the opposite party.

MARIVAUX, PIERRE CARLET DE CHAMBLAIN DE, a French author, born in Paris in 1688, died there, Feb. 16, 1763. He commenced his literary career by a series of travesties on the *Iliad*, La Fontaine's "Telemachus," and "Don Quixote," of which he subsequently professed himself ashamed; and going soon after into the opposite extreme, he produced a heavy tragedy, entitled the "Death of Hannibal." Finding his powers adapted neither to the sublime nor to

the grotesque, he attempted a new line of literature by writing pieces of intrigue for the stage. His comedies are chiefly remarkable for skillful analysis of human feelings, nice distinctions of character, and a kind of metaphysical subtlety in the development of passion and character. They number about 80, the greater part having been written for the Italian theatre, and were highly popular in their day, although now seldom performed. Among the best are *Le jeu de l'amour et du hasard*, the author's dramatic *chef d'œuvre*, and *Les fausses confidences*. He is now known chiefly by his romances, *La vie de Marianne*, and *Le paysan parvenu*, the former of which Jules Janin calls "an inexhaustible repertory of every form of wit and grace, of brilliant language, of delicate repartee, and of exquisite studies of human character." He also wrote *Le spectateur François* and *Le philosophe indigent*, distinguished like all his other works by an eccentric and affected style, called after him *marivaudage*, which has found many imitators in France. He was elected a member of the French academy in 1748, Voltaire being a rival candidate on the occasion.

MARJORAM (*origanum*, Linn.), the common name of a genus of plants in the natural order of *labiata*, having nearly entire leaves and purplish flowers crowded in cylindrical or oblong spikes, which are imbricated with colored bracts. Persoon enumerates 17 species; but the most common in the gardens is the sweet marjoram (*O. majorana*, Willd.), native of Barbary and the Himalaya mountains. It is a clean, pretty, low bushy plant, usually treated as an annual, but may be kept for several years by cultivation in pots or boxes during the winter time. The young and tender shoots readily take root and form abundance of new plants for the open border during the summer. The fragrant leaves and buds being carefully dried are pulverized by rubbing them in the hands, and are employed by cooks in the preparation of forced-meat balls or stuffing, imparting a pleasant seasoning to potted birds, roasted meats, or roasted fowls. The wild marjoram (*O. vulgare*, Linn.) has become sparingly naturalized in the United States, adventitiously introduced from Europe. It can be found occasionally upon dry banks and sunny slopes. Its flowers are very pretty, appearing in the months of July and August. The essential oil from the *origanum* has been employed to cure the toothache; it is said to be very powerful. For other medicinal preparations, as tonics and stomachics, it is seldom employed now, though once in some repute.

MARK ANTONY. See **ANTONY**.

MARK, SAINT, the Evangelist, according to the opinion of most theologians, identical with John Mark, mentioned in the Acts (xii. 12, 25). By comparing the passages of the New Testament relating to both Mark and John Mark, we learn the following facts of his life. He was the son of a certain Mary, who possessed a house at Jerusalem which served the Christians

as a place of refuge. About the time when James the Elder was executed, he left Jerusalem together with Paul, and Barnabas his cousin (A. D. 42), went with them to Antioch, and from there to Cyprus, but separated from them at Perga, in order to return to Jerusalem. Paul blamed this conduct; and when later Barnabas proposed to take Mark along on a new missionary tour, Paul objected, and Barnabas and Mark undertook a journey of their own. But we find him again as a friend and fellow laborer of Paul during the first captivity of the latter. It appears that both intended, after the end of the captivity, to visit the Christians of Asia Minor. Mark probably executed this design, for Paul requests Timothy (2 Tim. iv. 11) to bring Mark to Rome. He was with the apostle Peter, near Babylon (which, according to many interpreters, designates Rome), when that apostle wrote his first epistle. According to the testimony of the ancient church, Mark was in a particularly intimate relation to the apostle Peter, who employed him as secretary in the same way as Titus was employed by Paul. After the death of Peter, Mark is said to have gone to Egypt, and in particular to Alexandria, to have collected congregations in Alexandria and the neighborhood, to have been the first bishop of Alexandria, and, finally, to have suffered martyrdom there. He is the patron saint of Venice, which city claims to possess his body. His festival is celebrated in the Roman Catholic church on April 25.—The Gospel of Mark is distinguished from the three others by being more exclusively historical, and excluding longer didactic portions, such as the sermon on the mount. All the facts recorded in it may be found also in Matthew or Luke, and only 27 verses belong exclusively to Mark, a circumstance which has furnished to modern critics arguments for the most divergent, and sometimes most extravagant speculations. Some (as Eichhorn, De Wette, Schleiermacher, and Credner) have declared it a compilation from the Gospels of Matthew and Luke, in the arrangement of which the author was guided by the preaching and perhaps the advice of Peter; others, on the contrary, claim for the Gospel of Mark a priority in point of time. Many critics also assert that the Gospel in its primitive form no longer exists, and that we have in the canon of the New Testament a revised and enlarged edition of it. But this assertion is supported more by inference and speculation than by historical argument. The defenders of the originality of the Gospel of Mark in its present form generally place the time of its compilation between the death of the apostles Peter and Paul, and the destruction of Jerusalem. Rome is almost unanimously regarded as the place where it was written. The evangelist undoubtedly used the Greek language; a note to the Syrian translation, stating that the Gospel was compiled in Latin, received for a time wide currency among Roman Catholic scholars through the support of Baronius, but it has been almost entirely

discarded since the time of Richard Simon. Doubts are entertained also by prominent theologians of the orthodox school whether the last 12 verses are by Mark, or were added after his death; in support of the latter view it is adduced, that Jerome, Gregory of Nyssa, and other fathers expressly mention that the Gospel closed with the words: "For they were afraid" (xvi. 8); in favor of the other, that all the Latin and Syrian manuscripts have these verses.—For commentaries on Mark, see the collective works on the Gospels mentioned in the article *LUXA*. A commentary on Mark alone was published by J. A. Alexander (New York, 1858), and one on Matthew and Mark, by D. D. Whedon (New York, 1860). Accounts of the modern discussions about the origin and history of the Gospel of Mark may be found in Wilke, *Der Urevangelist* (Leipzig, 1838), and F. O. Baur, *Das Marcus Evangelium* (Tübingen, 1851).

MARL, a term commonly applied to soils consisting of sand, clay, and carbonate of lime, the last being in sufficient quantity to give a decided calcareous character to the mixture. In New Jersey the layers of greensand are very generally known as marl beds, a name more correctly applied to the tertiary beds made up of marine fossil shells which are found near the coast of the middle and southern states, and are employed for fertilizing the soil. In the northern states rich marl deposits are often found at the bottom of ponds, in the form of a thin white mud filled with minute fresh water shells of living species. (See *GREENSAND*.)

MARLBOROUGH, a N. E. district of S. C., bounded N. and N. E. by N. C., and S. W. by the Great Pedee, and drained by the Little Pedee and Crooked creek; area, 480 sq. m.; pop. in 1850, 10,789, of whom 5,600 were slaves; white pop. in 1859, 11,456. It has an undulating surface and fertile soil. The productions in 1850 were 351,870 bushels of Indian corn, 95,810 of sweet potatoes, 20,854 lbs. of rice, and 9,501 bales of cotton. There were 8 grist mills, 10 saw mills, 1 cotton factory, 20 churches, and 524 pupils attending public schools. Capital, Bennettsville.

MARLBOROUGH, DUKE OF. See *CHURCHILL, JOHN*.

MARLOWE, CHRISTOPHER, or *KIT*, an English dramatic poet, the greatest of the precursors of Shakespeare, born in Canterbury in 1564, killed in Deptford, June 16, 1598. His father, a shoemaker, succeeded in obtaining for him admission into King's school, Canterbury. He was afterward entered as a pensioner of Corpus Christi college, Cambridge, where he received the degree of bachelor of arts in 1583 and of master in 1587. In 1586 he produced the first part of his tragedy of "Tamburlaine," which exhibits more action on the stage, a more dramatic dialogue, and a far more varied and skilful versification, than any English play which had preceded it. It was ridiculed for its bombastic style and extravagant scenes, the hero "threatening the world with high astounding terms." It was

printed with a second part in 1590. His second play was the "Tragical History of the Life and Death of Dr. Faustus," a powerful though irregular drama, its poetical beauties being often intermingled with low buffooneries. The hero makes a pact with Lucifer, to whom he disposes of his soul on condition of having a familiar spirit and unlimited power at his command for 24 years. The awful melancholy of the fiend, as contrasted with the malignant mirth of Goethe's Mephistopheles, the struggles of awakened conscience in the hero, and the splendid horror of the termination, are its most striking features. The German puppet play constructed from this drama was the foundation of Goethe's great tragedy, which consequently in the opening has a striking resemblance to Marlowe's. The "Jew of Malta" has more vigorous passages than are to be found in any other Elizabethan play except those of Shakespeare. His "Edward II." contains a death scene which Charles Lamb says "moves pity and terror beyond any scene, ancient or modern." Several other plays of doubtful authorship have been attributed to him, and it is probable that the second and third parts of Henry VI. in Shakespeare were mostly written by Marlowe. He also made translations from Ovid, so licentious that the archbishop of Canterbury ordered them to be burned, yet they have been often reprinted. He is supposed to have been an actor as well as playwright, led a dissipated life, is stated to have held atheistical opinions, though there is no proof of this in his plays, and died from a wound received in a disgraceful quarrel. An edition of his works by Alexander Dyce was published in London in 1850, in 8 vols.

MARMONT, AUGUSTE FRÉDÉRIC LOUIS VISSÉ DE, duke of Ragusa, a marshal of the French empire, born in Châtillon-sur-Seine, July 20, 1774, died in Venice, March 2, 1852. He was descended from an ancient family, and at 15 years of age entered a regiment of infantry as sub-lieutenant. Three years afterward he was transferred to the artillery; and having fallen under the notice of Bonaparte, he was in 1796 appointed his 1st aide-de-camp, in which capacity he served with distinction in the Italian campaigns of 1796-'7. He accompanied the expedition to Egypt, and for his good conduct at the investment of Malta, he was appointed a general of brigade. He returned with Bonaparte to France, and for his coöperation on the 18th Brumaire was appointed commander-in-chief of the artillery in the army of reserve. The successful transportation of the French artillery over the Great St. Bernard in the spring of 1800 was in a great measure due to his exertions; and the skill with which he managed his batteries at Marengo procured him the rank of general of division. He participated with credit in the campaign of 1805 in Germany, and in 1806 was made commander-in-chief of the forces in Dalmatia, where he remained until 1809. For his successful defence of Ra-

gusa against a greatly superior force of Russians and Montenegrins, Sept. 30, 1806, he subsequently received the title of duke of Ragusa. After the battle of Aspern and Essling (May 21, 22, 1809) he brought up his corps in good order to the assistance of the emperor, defeating on the way superior bodies of Austrians in several decisive encounters; and for his conduct at the battle of Wagram and in the subsequent pursuit of the enemy, he was created a marshal of the empire, on the same day with Macdonald and Oudinot. In 1811 he was sent to relieve Masséna in Portugal, where he ended a series of ill-advised and unfortunate movements by losing the decisive battle of Salamanca, which ruined the French cause in the Peninsula. Having recovered from a severe wound received on this occasion, he joined the emperor in Germany in 1813, and fought at Lützen, Bautzen, Dresden, and Leipsic, with a valor which in some degree retrieved his military reputation. In the campaign of 1814 he vigorously coöperated with Napoleon in the brilliant but useless series of battles in which the advance of the allies was sought to be stayed, and on March 29 arrived with the remnant of his corps before Paris. At the battle of Paris, fought on the succeeding day, he showed the utmost intrepidity and devotion to the imperial cause, and, with the few thousand men comprising his own corps and that of Marshal Mortier, withstood for many hours the attacks of an army four times as numerous. An armistice was finally agreed upon, and late in the day Marmont, availing himself of a letter from Joseph Bonaparte, who had been appointed lieutenant-general of the empire, authorizing him to enter into an arrangement with the allied sovereigns, agreed to evacuate the city. On the 31st the allies entered Paris in triumph; and 4 days afterward Marmont, influenced by a *senatus consultum* declaring Napoleon's forfeiture of the throne, and abolishing the right of succession of his family, gave in his adhesion to the provisional government which had been formed under the presidency of Talleyrand; stipulating, however, that the life and personal freedom of Napoleon should be secured, and that the French troops should be provided with secure quarters in Normandy. On April 5 his corps, numbering 12,000 men, accordingly entered within the allied lines and took the road to Normandy. The indignation of Napoleon at this proceeding was boundless, and, in an order issued from Fontainebleau immediately after the news reached him, he expressly disavowed it, observing: "The emperor cannot approve the condition on which the duke of Ragusa has taken this step; he cannot accept life and liberty at the mercy of a subject." During the Hundred Days he expressly excepted him from the imperial act of amnesty, and subsequently at St. Helena, speaking of his defection, said: "I was betrayed by Marmont, whom I might call my son, my offspring, my own work; by him to whom I had committed

my destiny, by sending him to Paris at the very moment he was putting the finishing stroke to his treason and my ruin. . . . Marmont will be an object of horror to posterity. As long as France exists his name will not be mentioned without a shudder." He received numerous distinctions from the Bourbons after the first and second restorations, but about 1825 retired to his country seat, whence, in July, 1830, he was suddenly summoned to Paris to quell the revolt against Charles X. Failing in this, he was obliged to share the exile of the king; and so strong was the odium excited against him, that his name was struck from the list of the French army. He never reentered France, but wandered over Europe, fixing his residence finally at Venice, where his latter years were passed. He published his travels in Hungary, southern Russia, Syria, Egypt, &c., and *Esprit des institutions militaires*, which Marshal Bugeaud wished to place in the hands of every officer in the service; and left an autobiography, published in Paris under the title of *Mémoires du duc de Raguse* (9 vols. 8vo., 1856).

MARMONTEL, JEAN FRANÇOIS, a French author, born in Bord, Limousin, in 1728, died at Abbeville, near Evreux, Dec. 31, 1799. Of humble birth, he was educated gratuitously under the Jesuits of Mauriac, and was intended for the priesthood. His love of literature prevented this career, and also withdrew him from commerce, in which his father sought his establishment, and he became professor of philosophy at Toulouse, where his verses took the prize of the *jeux floraux*. Voltaire, with whom he began a correspondence, induced him to remove to Paris in 1745, where he quickly obtained the prize of the French academy for a poem, and produced several tragedies which the genius of Mlle. Clairon made eminently successful on the stage. Protected by Mme. de Pompadour, he became in 1753 historiographer of the royal buildings, and in 1758 publisher of the *Mercur de France*, and thus had a large income. To the *Mercur* he contributed the *Contes moraux*, on which his fame chiefly rests, and which have been greatly admired as specimens of light and lively writing. His position as manager of the *Mercur* was lost after two years in consequence of a satire on the duke d'Aumont, and he was confined for a few days in the Bastille. Admitted into the academy in 1763, he succeeded D'Alembert in 1768 as perpetual secretary. He left Paris during the revolution, was one of the moderate deputies in the *conseil des anciens* in 1797, and lived again in retirement after the 18th Fructidor. His best theatrical pieces are the tragedies *Les Héraclides* and *Numitor*, the operas *Didon* and *Pénélope*, and the comic operas *Sylvain* and *Zémire et Azore*. He also wrote the romances *Bélisaire* (1767) and *Les Incas* (1777), collected his articles in the *Encyclopédie* under the title of *Éléments de littérature* (6 vols., 1787), published a history of the regency of the duke of Orleans, and left trea-

tises, designed for the education of his children, on the French language, logic, metaphysics, and morals, and his own *Mémoires* (4 vols., 1804). A complete edition of his works was published in 18 vols. (1808), and a select edition in 10 vols. (1824).

MARMORA, SEA OF (anc. *Propontis*), a body of water lying between European and Asiatic Turkey, 172 m. long, and about 55 m. wide. Its N. E. extremity is connected with the Black sea by the Bosphorus, and its S. W. extremity with the archipelago by the Dardanelles. It is remarkable for its depth, which in some places is over 850 fathoms. It has numerous excellent harbors on its N. shore, contains several islands, the principal of which is Marmora, and receives the waters of many but inconsiderable tributary streams. It has no tides, but a current of variable strength and velocity runs through it from the Euxine to the archipelago. Its shores present a picturesque aspect, and are especially bold and precipitous on the Asiatic side.—The ISLAND OF MARMORA (anc. *Proconnesus*; Turk. *Marmar Adası*), which gives name to the above sea, is about 45 m. in circumference, and for the most part mountainous and barren. It has been celebrated from a remote age for its marble (whence its name, from Lat. *marmor*), with which in ancient times it supplied Cyzicus and other Hellenic cities, as in modern times it has supplied Constantinople. The capital, Marmora, stands on the S. W. coast, and is chiefly built of wood. The highest summit of the island is in lat. 40° 36' N., long. 27° 35' E.

MARMOSET, the common name of the South American monkeys of the family *haplidae*, including the genera *hapale* (Illiger) and *midas* (Geoffroy). The number of teeth is the same as in the old world apes and in man, viz.: incisors $\frac{1}{1}$, canines $\frac{1}{1}$, and molars $\frac{4}{4}$, with acute tubercles. They are all of small size, resembling squirrels in form and agility; the rounded head is frequently furnished with ear-like tufts of silky hair on the sides; the feet are 5-toed, the posterior having an opposable thumb with a flat nail, all the other fingers of both extremities having sharp claws, with the anterior thumb scarcely opposable; the tail is long and bushy, but not prehensile, and the body is covered with soft woolly fur.—In *hapale* the muzzle is short; the facial angle 50°; the upper lateral incisors insulated, the lower the longest, narrow, and convex outward; lower canines smallest. The striated marmoset or onistiti (*H. jacchus*, Ill.) is about 8 inches long, and the tail about a foot; the general color is a deep gray, with the lower back and tail banded with brown, head chestnut, spot on forehead and long hairs on cheeks and behind the ears white. It is a handsome and cleanly animal, walking on all fours, and like the rest of its family lives in the woods of Brazil, running about in the trees in pursuit of insects, fruits, small birds, and eggs; it is easily tamed, and makes an interesting and affectionate pet; in captivity it will eat almost any vegetable or animal food;

it is not so intelligent as the other monkeys; it breeds occasionally in confinement.—In *midas* the lower incisors are short and broad, and the forehead more prominent; the species are commonly called tamarins, and include some of the smallest and prettiest monkeys. The silky marmoset (*M. rosalia*, Geoffr.) is of a golden yellow color, sometimes with a reddish tinge, the fur being very soft and silky and forming a kind of mane upon the neck; its disposition is gentle, but its constitution is so delicate that it soon dies from the exposure of even temperate climates. The leonine marmoset or leoncito (*M. leoninus*, Geoffr.) is the smallest monkey known; the color is brownish with black face and brown mane, which it erects when angry, whence its name.

MARMOT, a large rodent of the squirrel family, and genus *arctomys* (Schreber). The body is thick and compressed, the head large and flattened, the legs short and stout, and the tail short, bushy, and nearly cylindrical; the incisors are less compressed than in the squirrels, smooth in front and rounded; the molars are $\frac{1}{1}$ - $\frac{1}{1}$, enamelled continuously, with transverse pointed tubercles, the first upper one the smallest; the ears are short and rounded, but distinct above the fur; the fore feet with 4 toes armed with sharp claws, and a very rudimentary thumb with a small flat nail instead of a claw; the hind feet 5-toed, with strong curved claws; the soles are entirely naked; there are very shallow cheek pouches. The common European marmot (*A. marmota*, Schreb.) is 18 inches long, the tail $2\frac{1}{2}$ inches; the color is yellowish gray, with the top of the head dark gray, russet at the base of the tail, and incisors yellow. The form is clumsy, the movements slow, and the sagacity small; inhabiting the mountains of Europe near the snow line, they live in families in burrows, in which they pass the winter in a state of lethargy; the food is vegetable, during the search for which one animal is stationed as a sentinel near the burrow, into which all retreat at the signal of danger; the circular chamber for the family is approached by a narrow gallery 5 or 6 feet long; they hibernate on beds of dried grass, and are very fat at the beginning and very lean at the end of this season; when fat they are sometimes used by the mountaineers as food. The Poland marmot (*A. bobac*, Fall.) is sometimes larger, with more reddish tints. They burrow in the plains of less elevated districts in Poland, Russia, and northern Asia; they prefer dry and stony soils, into which they dig very deeply, living in families of 30 or 40, and amassing large quantities of dried grasses. Other marmots are described, which occasionally, as perhaps do all, feed upon birds and small quadrupeds. The American marmot (*A. monax*, Gmel.) will be noticed under **WOODCHUCK**, its common name. Many animals of the allied genus *permophilus* (Cuv.) are sometimes called marmots, but such come more properly under the head of prairie squirrels. The fur is thick and not very coarse, and is considerably used for common caps, robes, and similar objects.

MARNE, a N. E. department of France, in the old province of Champagne, bounded N. by Aisne and Ardennes, E. by Meuse and Haute-Marne, S. by Aube, and W. by Seine-et-Marne and Aisne; area, about 3,000 sq. m.; pop. in 1856, 372,050. The surface is an inclined plane, sloping from E. to W., and diversified by a few hills of moderate elevation. It is divided into 2 nearly equal parts by the river Marne, whence it derives its name. The land adjoining this river is rich, but the soil elsewhere is in general light and barren. The principal rivers, beside the Marne, are the Aisne, Suippe, and Vesle, in the N. and N. W., and the Aube and Seine in the S. The wine annually made amounts to over 15,000,000 gallons, mostly champagne. The most important manufacture is that of wool, which centres chiefly at Rheims. Capital, Châlons-sur-Marne.—**MARNE** (anc. *Matrona*), a river of France which rises in the department of Haute-Marne, and, after a N. W. course of about 280 m., falls into the Seine near Paris. Its principal tributaries are the Ornain, Blaise, Petit-Morin, and Grand-Morin. The chief cities on its banks are Langres, Chaumont, Joinville, St. Dizier, Vitry-le-François, Châlons, Epernay, and Meaux. It is navigable from its junction with the Seine to St. Dizier, 210 m. The Marne is connected with the Rhine and Aisne by means of canals.

MARNE, HAUTE. See **HAUTE-MARNE**.

MARONITES, the name of a body of Christians in Asiatic Turkey, who recognize the supreme authority of the pope, and therefore form a part of the Roman Catholic church. They chiefly inhabit Mt. Lebanon, its declivities and valleys, between Tripolis (Tarablus), Tyre, and the lake of Genesareth. In smaller numbers they are also found in Aleppo, Damascus, and several other places in Syria, and in the islands of Cyprus. Their chief seat is in the district of Kesrawan, which is inhabited almost exclusively by Maronites, while everywhere else they live mixed with Jacobites, Greeks, Druses, and others. The *Notizia statistica delle missioni Cattoliche* (Rome, 1843, p. 170) gives their number as about 500,000, but according to other authorities it does not amount to more than about 150,000. They were originally Syrians, and still use the old Syrian language in their worship; but their conversational language at present is the Arabic. They enjoy a kind of political independence, being governed by native sheiks who only pay an annual tribute to the Ottoman sultan. The supreme government is in the hands of 4 chief sheiks, who are also their leaders in war. As they are accustomed to go armed, from 30,000 to 40,000 men are always ready to march. Formerly they lived in peace with their neighbors, the Druses, but in 1841 a national war commenced between the two tribes, from which especially the Maronites suffered greatly. In May, 1860, the war with the Druses broke out with new and unprecedented fierceness. The Druses, aided by the sympathy of the Mohammedan population and even of the Turkish troops, very soon over-

powered the Maronites, and sought to exterminate every thing Christian in Syria. About 160 towns and villages were burned, nearly the entire Maronite territory laid waste, more than 10,000 men slaughtered, 25,000 Christian women sold to the Turkish harems, and the rest of the population made beggars. The massacre at Sidon and other places was of unparalleled cruelty. On July 10, the entire Christian quarter of Damascus was sacked, and the population for a great part massacred; but, contrary to general expectation, two days later a treaty of peace was concluded. To prevent the return of similar atrocities, the European powers, at a conference held in Paris, agreed, on Aug. 8, upon an intervention in Syria for the protection of the Christians. (See **SYRIA**.)—The derivation of their name, and the time when their independent ecclesiastical organization commenced, have not yet been established with entire certainty. The prevailing opinion is that they were called either after a hermit, Maro, who lived in the 5th century, or after their first patriarch, John Maro, who lived two centuries later. The Maronite writers, as Abraham Echellensis (1651), Nagron (1679), Assemani, and more recently Murad (*Notice historique sur l'origine de la nation Maronite*, Paris, 1844), maintain that the Maronites always professed the orthodox faith; and a few Roman Catholic writers have supported this view. But most historians, Catholics (Baronius, Renaudot, Le Quien, Richard Simon, and others) as well as Protestants, are of opinion that the Maronites were Monothelites until 1182, when their patriarch with several bishops entered into a union with the Roman Catholic church. A permanent union of the Maronite nation with Rome was effected in 1445. In 1584 Pope Gregory XIII. founded in Rome a Maronite college, from which they have since received most of their priests. Clement XII. in 1736 prevailed on a national synod to accept the resolutions of the council of Trent. The popes have permitted the Maronites, as well as the other oriental sects which have accepted a union, to retain a number of old traditional usages; thus they receive the Lord's supper in both kinds, their priests are allowed to marry, &c. Their liturgy they derive from Ephraem Syrus. As a church they are governed by a patriarch, who lives in the convent Dair al Shafee on Mt. Lebanon, and always bears the name Peter and the title patriarch of Antioch. Every 10th year he has to give an account of the condition of the church to the pope. The Roman almanac mentions moreover an archbishopric and 6 bishoprics. (See Schem's "Ecclesiastical Year Book," New York, 1859, p. 33.) Several bishops also reside with the patriarch. The number of congregations is about 150. Convents were formerly very numerous; in the district of Kesrawan alone more than 200 were counted with about 20,000 members, all following the rule of St. Anthony; but in consequence of the recent wars with the Druses many convents have perished.

MAROONS, fugitive slaves in the European colonies in the West Indies and in Guiana, who have banded together in the forests and mountains and maintained their freedom. The origin of the word is uncertain, it being derived, according to one etymology, from the Spanish *marrano*, "wild hog," these fugitives subsisting at first chiefly by hunting that animal; according to another, from *simaran* or *cimanon*, which signifies both an ape and a wild man; and by still a third derivation, from Marony, a river which separates French from Dutch Guiana, where large numbers of them resided. They are particularly celebrated in the history of Jamaica. On the conquest of that island from the Spaniards by the English in 1655, most of the Spanish slaves, about 1,500 in number, fled to the mountains, whence they kept up a guerilla warfare against the whites. They became so troublesome that in 1663 the governor, Sir Charles Lyttleton, issued a proclamation offering pardon, freedom, and 20 acres of land to such as should surrender; but it does not appear that any of them accepted the terms offered. Their numbers enlarged by natural increase and by accessions of other fugitives from slavery; and the colonial assembly in the course of 40 years passed 44 acts against them, and expended £240,000 in vain efforts for their subjugation. In 1780 they were grown so formidable, under a very able general named Oudjoe, that all the militia of the colony and two regiments of regular troops were sent against them. But after 7 years' war they were still unsubdued, and in 1787 the colonial assembly imported Indians and bloodhounds from Spanish America to aid in their suppression. Even these failed, however, and at length the royal governor Trelawny made overtures of peace to the black chiefs; and on March 1, 1788, the Maroons agreed to a treaty which provided: "First, that all hostilities shall cease on both sides for ever; secondly, that the said Captain Oudjoe, the rest of his captains, adherents, and men, shall be for ever hereafter in a perfect state of freedom and liberty; thirdly, that they shall enjoy and possess, for themselves and posterity for ever, all the land situated and lying between Trelawnytown and the Cockpits, to the amount of 1,500 acres." Beside the arable land thus given them for cultivation, the Maroons had for their hunting grounds the whole mountainous interior of the island. Their game was the wild boar, which abounds in the mountains. They had a method of curing the flesh without salting it, and they sold large quantities of it to the whites, and by this traffic kept themselves well supplied with firearms and ammunition. There were no hostilities between them and the whites for many years, until in July, 1795, a portion of them known as the Trelawnytown Maroons rose in insurrection in consequence of two of their young men having been publicly whipped by the authorities for stealing. Their rising created so much alarm that the island was put under martial law, although the government

had a force of 1,500 regular troops and several thousand militia. The earl of Balcarres, the governor of Jamaica, marched against them in August with a large body of troops, but was defeated and driven back with considerable loss. In the war that ensued the Maroons at first met with much success, until Gen. Walpole by great efforts brought them to be willing to listen to overtures of peace. About 600 of them surrendered on assurances of liberty and good treatment, but were perfidiously placed in confinement, and on June 6, 1796, shipped from the island and sent to Nova Scotia, whence in 1800 they were again transported to Sierra Leone. Those who remained in Jamaica maintained their independence; but since the abolition of slavery in the island they have to a great extent intermingled with the mass of the colored population. In 1885 it was officially reported that in 4 of their settlements in Jamaica there were 270 families, or about 1,500 persons.—In the Dutch colony of Surinam, in South America, a band of Maroons was formed at a very early period of the colony in the forests of the interior, but they did not become formidable till about 1726, when they had acquired by pillage lances and firearms. They settled on the upper part of the river Seramica, and were consequently soon known as Seramica negroes. Several detachments of soldiers and militia having been sent against them without much success, the authorities in 1780 undertook to terrify them into submission by executing 11 of them who had been taken prisoners. One man was hanged alive by an iron hook stuck through his ribs, two others were burned alive, 6 women were broken upon the wheel, and 2 girls were beheaded. These cruelties, however, only enraged the Maroons, and their incursions became so troublesome to the colonists that the government at length resorted to negotiation, and a treaty of peace was formally concluded in 1749, between the governor of Surinam and the Maroon chief, Captain Adoe. From some misunderstanding between the parties, this truce was not of long continuance, and fresh revolts broke out among the slaves on the Onca river, so that in a few years the colony was reduced to the greatest distress by their incursions; and in 1757, after being defeated by the negroes in several encounters, the Dutch again sued for peace. After a long negotiation and 4 different embassies from the Europeans, a treaty was concluded in 1761, by which the Onca and Seramica Maroons were admitted to be free and independent, and the colony agreed to pay them an annual allowance to secure their friendship. After some years a revolt occurred among the negroes on the Cottica river, which gained such force in 1772 that the colonists were forced to abandon their plantations and take refuge in Paramaribo until assistance arrived from Holland. A force of 1,200 Dutch troops, assisted by several hundred negroes liberated and armed for the purpose, at length drove the Maroons back to the woods. With additional troops

from Holland a systematic attempt was now made to subdue the Maroons, but without success; and at the end of a war which lasted several years the colonial government withdrew from the contest. The Maroons at that time were about 15,000 in number. In 1831 they had increased to 70,000, and at present they are still more numerous. They form an independent republic, with laws and customs of their own. Christianity has made little progress among them, and their language is a jargon of African and European tongues intermingled.—For an account of the Maroons of Jamaica, see Bryan Edwards, "History of the West Indies," and Dallas, "History of the Maroons;" and for the Maroons of Surinam, see Stedman's "Surinam." See also "The Maroons of Jamaica," and "The Maroons of Surinam," in the "Atlantic Monthly," Feb. and May, 1860.

MAROS, the most important river of Transylvania, rising near the E. frontier, flows N. W., S. W., and finally W., enters Hungary, and after a course of about 400 m. falls into the Theiss near Szegedin. Its principal affluents are the two Kokels in Transylvania, in which country its banks offer much picturesque scenery. The chief towns on its banks are, in Transylvania, Saxon-Regen, Maros-Vásárhely, the principal town of the Szeklers, and the fortress Carlsburg; and in Hungary, Ménes, Arad, and Makó. During the revolutionary war of 1848-'9 the Maros formed a strategical line of great importance. It now forms the N. boundary of the Voivodina and Banat, which have since been detached from Hungary.

MAROT, CLÉMENT, a French poet, born in Cahors in 1495, died in Turin in Sept. 1544. His father, Jean Marot, was also a poet, valet de chambre to Francis I., and, like the son in after life, noted for his irregularities. Clément first became page to the sieur de Villeroy, and subsequently to Margaret, duchess of Alençon, and sister of the king, whose husband he followed to the army in 1521, on the breaking out of the war with Charles V. On the death of his father he succeeded him as valet de chambre to Francis I., accompanied him to Italy, and was wounded and made prisoner at the battle of Pavia in 1525. On recovering his liberty and returning to Paris, he was accused of heresy and cast into prison, at the instigation, as has been stated, of Diana of Poitiers. The king, on his return from captivity in Spain, ordered his release, as he did again a year later when he was imprisoned for a misdemeanor. In 1535, the charge of heresy being revived, he retired to the court of Margaret, now become queen of Navarre, and went thence to Ferrara and Venice. In 1536 he returned to Paris, having abjured the heretical doctrines at Lyons. His metrical translations of the Psalms, which were very popular, and were sung by the king and the whole court, being condemned as heretical by the Sorbonne, he again fled in 1543 to Geneva, where he added 20 Psalms to the 80 previously published. He then went to Turin,

where he died in great poverty. His poems consist of epistles, rondeaux, ballads, epigrams, &c. His most important longer productions, beside the translations of the Psalms, were *L'enfer*, a satire upon the lawyers, and a new version of the *Roman de la rose*. His son Michel was also a poet, though much inferior to himself; and a complete edition of the works of the three Marots was published at the Hague in 1731, in 8 vols. 4to. The works of Clément Marot have been frequently reprinted.

MARQUE, LETTER OF. See PRIVATEER.

MARQUESAS ISLANDS, or MENDANA ARCHIPELAGO, a cluster of 18 small islands in the South Pacific ocean, between lat. 8° and 11° S. and long. 138° 30' and 143° W.; aggregate area, 1,800 sq. m.; pop. about 25,000. They are generally divided into a southern group (Hiwaoa, Tahuata, Motane, and Tiboia), which was discovered in 1596 by the Spaniard Mendaña de Neyva, and by him named Las Marquesas de Mendoza in honor of the viceroy of Peru, the marquis de Mendoza; and a northern group, discovered by Captains Marchand and Ingraham (1791). Among the latter, the islands of Nukahiva, Huahuna or Washington island, Huapu or Adams island, Shotomiti or Franklin island, and Futu-uhu are the largest. They are of volcanic origin, a fact which is attested by long rows of bleak basaltic rocks. Each island is formed by a mountain ridge, which rises to an elevation of 2,000 or 3,000 feet, sending forth numerous lesser chains, between which fertile valleys open toward the ocean. The coast is for the most part rugged and precipitous, and the roadsteads being unprotected furnish no safe anchorage. The climate and productions resemble those of the other volcanic islands of subtropical Polynesia. The rainy season lasts from November to April. Droughts are not unfrequent during the hot season; Krusenstern mentions one which lasted for 10 months. The valleys, the soil of which is formed by hundreds of layers of decayed vegetation, are extremely fertile, and produce all tropical fruits in abundance. The yam, sugar cane, banana, plantain, taro, sweet potato, cotton plant, &c., grow almost without culture. The hillsides are covered with forests of cocoanut, breadfruit, and papaw trees, the fan palm, and numerous other trees; but the vigorous growth of underbrush renders them almost inaccessible. The fauna of the islands is as poor as their flora is rich. There are no indigorous mammalia, but swine, rats, and cats have been introduced from Europe. Of birds there are only 4 or 5 distinct species; among them the kurukuru and the gupil, a parrot of the size of the robin, are the most beautiful. Water fowl abound on the coast; and valuable mussels are found near the shore.—The inhabitants belong to the Malay race, and are distinguished by grace and symmetry of person. Their complexion is of a light copper color; the women appear almost white, but this complexion is produced by the application of the root of the papaw tree. Tattooing

is practised by both sexes. Their social organization is similar to that which prevailed in the Sandwich islands before the introduction of Christianity. They are divided into many tribes or clans, among whom bloody wars are of frequent occurrence. The "taboo" serves them instead of religion. The tabooed or privileged classes consist of *atnas*, who are venerated as superior beings; *tanas*, soothsayers and "medicine men;" *tataunas*, priests and surgeons; *uhus*, the lowest rank of the hierarchy; *katai-kis*, secular rulers; and *toas*, war chiefs. The non-tabooed classes are the *peto peketoas*, servants of the chiefs; *averias*, fishermen; *hokis*, singers and dancers; and *nohuas*, common laborers. The last named class hold a similar position to that of the pariahs in India. Among the peculiar social institutions of the islanders is polyandry, the woman choosing her husband or husbands, and retaining them or not according to her pleasure. Cannibalism is also practised sometimes, but simply as an act of vengeance; it is only the bodies of slain enemies of which, now and then, a slice is eaten. Their ordinary food consists principally of vegetables. A highly intoxicating beverage is prepared by chewing the root of the kanoa plant (*piper metisticum*), mixing it well with saliva, and then spitting it into a vessel, in which it is perfected by fermentation. The extensive use of this beverage produces leprosy or consumption. Beside these diseases, elephantiasis, scrofula, liver complaints, inflammation of the lungs, and diseases of the eyes, often resulting in blindness, are common among the islanders. Their scanty clothing is obtained from the mulberry tree, the bark of which they render thin and soft by beating, thus forming a kind of coarse cloth. Their habitations, small log huts thatched with leaves of the cocoanut tree, are erected on stone platforms from 8 to 5 feet above the ground. In similar houses they bury their dead.—These islanders have no history. Even the first discovery of the islands by Europeans has been entirely forgotten, though the Spaniards, who introduced swine, and also Cook and Marchand, are still venerated as gods. The Marquesas islands were taken possession of by Admiral Dupetit-Thouars, by authority of the French government, June 28, 1842. The inhabitants afterward made some unsuccessful attempts at reconquering their liberty. Under Napoleon III. the island of Nukahiva has been made a penal colony for political convicts.—See the voyages of Cook, Krusenstern, and Langsdorf.

MARQUETRY. See BUHL-WORK.

MARQUETTE. I. A central co. of the upper peninsula of Mich., bounded S. W. by Wisconsin and N. E. by Lake Superior, and intersected by the Michigamig river; area, 8,900 sq. m.; pop. in 1850, 136. The surface is diversified, covered by extensive pine forests, and the soil fertile. It contains granite, limestone, and iron ore. Capital, Marquette. II. A central co. of Wis., intersected by the Neenah or Fox river; area, 864 sq. m.; pop. in 1855,

14,880. It contains Buffalo, Puckawa, and Green lakes. The surface is diversified and the soil good. The productions in 1850 were 85,614 bushels of wheat, 48,052 of Indian corn, 66,197 of oats, and 36,724 of potatoes. There were 2 grist mills, 5 saw mills, and 298 pupils attending public schools. Value of real and personal estate in 1855, \$2,189,087. Capital, Marquette.

MARQUETTE, JACQUES, one of the first explorers of the Mississippi river, born in Laon, France, in 1687, died May 18, 1675. At the age of 17 he entered the society of Jesus, and in 1666 sailed for Canada as a missionary. He spent about 18 months in the vicinity of Three Rivers, where he acquired the Montagnais and Algonquin languages, and in April, 1668, went to Lake Superior and there founded the mission of Sault Ste. Marie. In the following year he was sent to take the place of Father Allouez among the Ottawas and Hurons at Lapointe; but his stay here was short, these tribes being soon dispersed by the Sioux. Marquette then followed the Hurons to Mackinaw, and there in 1671 built a chapel at the mission of St. Ignatius, or Michilimackinac. In the following year he wrote of his success at Mackinaw to Father Dablon, the superior of the Jesuit missions in Canada. "I am ready, however," he continued, "to leave it in the hands of another missionary to go on your order to seek new nations toward the South sea who are still unknown to us, and to teach them of our great God whom they have hitherto not known." As early as 1669 in fact he had resolved upon exploring the Mississippi, of which he had heard from the Indians, and had made preparations at Lapointe to visit "this river and the nations that dwell upon it, in order to open the passage to so many of our fathers who have so long awaited this happiness." His desire was not gratified however until 1673, when Frontenac and Talon, the governor and intendant of Canada, having resolved to send an expedition under Louis Jolliet to explore the direction and mouth of the Mississippi, Marquette was instructed to accompany the party as missionary. With 5 other Frenchmen they left Mackinaw in 2 canoes on May 17, and reaching the Wisconsin river by way of Green bay, Fox river, and a portage, floated down to the Mississippi, on whose waters they found themselves by the 17th of June. On the 25th they stopped at an Indian village, where they were kindly received. Somewhere near the mouth of the Ohio, then called the Onaboukigou, from which was formed its subsequent name of the Wabash, they met savages who assured them that it was not more than 10 days' journey to the sea, and that they bought stuffs and other articles of Europeans on the E. side. Continuing their voyage, they arrived at a village called Akamsea, probably about the mouth of the Arkansas. Here they held a council, and having satisfied themselves that they were not more than 2 or 3 days' journey from the mouth of the river, which undoubtedly emptied into the gulf of Mexico or

off the Florida coast, and not, as had been conjectured, in California or Virginia, they resolved to return, especially as their further progress would expose them to the danger of a captivity among the Spaniards. They began their homeward voyage on July 17, and, passing up the Illinois instead of the Wisconsin, arrived in September at Green bay. They had accomplished the object of their mission, and travelled in their open canoes a distance of over 2,500 miles. On the banks of the Illinois Marquette had promised the Kaskaskia Indians to return and preach to them. He was detained by sickness at the mission of St. Francis Xavier on Green bay a full year; but in Oct. 1674, having previously sent to his superiors an account of his journey down the Mississippi, he set out with two white men and a number of savages for the village of Kaskaskia. On Dec. 14 he was stopped at the portage on the Chicago by infirmities and severe cold, and dismissing the Indians resolved to winter there with his two companions. Resuming his journey, March 80, 1675, he reached Kaskaskia April 8, and at once began a mission by erecting an altar and celebrating the festival of Easter; but, conscious that his end was approaching, he soon attempted to return to Mackinaw. He reached no further than a small river whose mouth is on the E. shore of Lake Michigan, and which still bears his name, and there he died in the presence of the two Frenchmen who had attended him from Green bay. He was buried on the spot, but in 1677 his remains were carried to Mackinaw. The narrative of his voyage on the Mississippi was not published until 1681, when it appeared at Paris in Thévenot's *Recueil de voyages*, accompanied by a map. This narrative, as well as a journal of the missionary's last expedition, and his autograph map, may be found in Shea's "Discovery and Exploration of the Mississippi Valley" (New York, 1859). His narrative, for some years after its first publication, was regarded as a fable; but his claim is now established as the first explorer of the great river of the West, and the first European who saw it after De Soto.

MARQUIS, or **MARQUESS**, a title of dignity in England, France, and Italy, ranking next below that of duke. In Germany, whence it derives its origin, the corresponding title is *Markgraf*, in English margrave or lord of the marches; and the persons so called or created were originally military chieftains to whom was committed the guardianship of the marches or frontiers of a kingdom. Hence the barbarous Latin word *marchio*. In continental Europe the *marchiones*, from being mere life occupants of their office, became at a comparatively early period territorial potentates, transmitting their titles and possessions, until they were established as a powerful hereditary order of nobility. In England the lords or wardens of the marches were originally barons or earls, whose office it was to preserve the frontier (as on the borders of Wales or Scotland) free from the inroads of

the enemy. The office was regarded for many centuries as a special or temporary one, and the term *marquis*, as distinguished from other titles of honor, was unknown until 1885, when Richard II. created his favorite Robert de Vere, earl of Oxford, marquis of Dublin for life, and gave him precedence between the degrees of earl and duke. The next creation was that of John de Beaufort, earl of Somerset, who was in 1897 made marquis of Dorset, and who, after being degraded in parliament, where he was only considered as earl of Somerset, declined to have the new honor restored to him, on the ground that "the name of marquis was a strange one in the kingdom." Such seems to have been the prejudice existing against the title, that it was not again conferred until 40 years afterward, in the reign of Henry VI. Thenceforth it continued to be occasionally bestowed, but was scarcely ever borne by more than 8 or 4 persons at a time until the latter half of the reign of George III., when the number of marquises was made equal to that of the dukes. Both in England and on the continent the title is now simply one of nobility, conferring upon the possessor no territorial rights or military command. Napoleon I. neglected to make use of it in establishing his new orders of nobility; but upon the restoration of the Bourbons it was readopted, and many counts of the empire were made marquises. In the British peerage the number of marquises is 37, of whom 4 bear Scottish and 12 Irish titles.

MARRACCI, **LUDOVICO**, an Italian orientalist, born in Lucca in 1612, died in Rome in 1700. He devoted himself from his youth to the study of languages, became a proficient in Greek, Hebrew, Syriac, Chaldean, and Arabic, and was appointed professor of Arabic in the college della Sapienza at Rome. Pope Innocent XI. highly esteemed him, chose him as his confessor, and would have advanced him to ecclesiastical dignities had not the modesty of Marracci declined them. His greatest work is his edition of the Koran in the original Arabic, with a Latin translation (Padua, 1698).

MARRAST, **ARMAND**, a French journalist and politician, born at St. Gaudens in 1800, died in Paris, March 11, 1852. After filling for 10 years the position of teacher in the college of Orthez and in that of Louis le Grand at Paris, he became a journalist, and attracted attention by a political pamphlet, and by his attacks on the eclectic school of philosophy represented by Cousin. After the revolution of July, 1830, as one of the editors of the *Tribune* newspaper, the organ of the extreme republicans, he was noted for the violence of his attacks upon the new government. The latter retaliated by imposing fines and imprisonment; and in 1834 Marrast, who had been arrested on a charge of complicity in various insurrections, escaped to England, where he acted as a correspondent of the *National*, then under the control of Armand Carrel. He now married a woman of fortune, and on the general amnesty of 1837 returned to France. He became the successor of Carrel

as editor in chief of the *National*, which continued to be the leading organ of the French liberals. After the revolution of Feb. 1848, upon the formation of the provisional government, he was appointed mayor of Paris. Subsequently he was returned to the constituent assembly by 8 different departments, and was elected its president, an office which he filled by successive elections for several months. His views, however, being deemed too conservative, he became unpopular, and in the election of members of the legislative assembly not a single constituency in France put him in nomination. He continued to contribute to the columns of the *National* until its suppression by Louis Napoleon, and died in comparative obscurity.

MARRIAGE, in law, the conjugal union of one man with one woman. In all Christian communities the marriage relation exists, and is considered as the most solemn of contracts; and excepting in Protestant countries, it is regarded as a sacrament. In England, although not a sacrament of the church, it is not only celebrated as a religious ceremony, but until very recently it fell almost exclusively under the cognizance of the ecclesiastical courts. Now, however, the new court of probate and divorce exercises some of the functions heretofore belonging to the ecclesiastical courts, together with some others, especially in the matter of divorce, which are quite new in English law. In the United States marriage is, by law, only a civil contract; magistrates, equally with clergymen, have a right to solemnize it; but it is the prevailing practice of the country to have it performed by a clergyman, and attended with religious ceremonies. One very grave question remains in a state of singular uncertainty; it is: What is necessary to constitute a complete and valid marriage; or rather, are the ceremonies and forms, or any of them, which are indicated by law or are customarily used for the solemnization of marriage, indispensable, or is the mere consent of the parties sufficient? That such a question as this should be unsettled both in England and in this country, may well occasion surprise. But the true explanation of the mystery is, we apprehend, that very few persons have trusted to their own mere consent for the validity of their marriage, and the question has therefore very seldom come directly before the courts. Recently, however, this precise question has passed through the English courts. It came first before the court of queen's bench in Ireland, upon a trial for bigamy. The defendant was found guilty, and then, the first of the marriages not having been solemnized according to the direction, if not requirement of law, the question arose whether it was so complete and perfect as to make the crime of bigamy possible. There were four judges, and they were equally divided. The chief justice then (against his opinion) joined *pro forma* with the two who thought the marriage valid, and the crime of bigamy committed, for the purpose of having a decision by a major-

ity, from which an appeal could be made to the house of lords in England. The lords requested the opinion of the judges. They returned to the lords an opinion that the marriage was not full and complete without both the civil contract and the religious ceremony; but it was also their prevailing belief that the contract, although not constituting of itself a complete and valid marriage, gave to each party the right to call upon the proper court to compel the other party to make the marriage formal and unquestionable; a thing which could not be done here. The question of the validity of the marriage by mere consent was then fully argued by the ablest counsel in England before the lords, and the six law peers gave their opinions severally, each at great length; and they were equally divided—Lords Brougham, Denman, and Campbell being in favor of the validity of the marriage at common law, and Lords Lyndhurst, Cottenham, and Abinger against it. And it may be added as a curious result of legal forms, that as the house of lords came to no conclusion, they did not reverse the judgment of the Irish court of queen's bench. That decision was therefore confirmed, and the defendant sentenced accordingly, although the record of the case itself showed that one half of that court had not thought him guilty in law, and that the chief justice had said that he was (at the same time expressing his opinion that he was not) merely to enter up a judgment from which an appeal might be taken. Almost at the same time, by an odd coincidence, the same question came before the supreme court of the United States, and Chief Justice Taney, in deciding the case (on other grounds), said: "Upon this point the court is equally divided, and no opinion can be given." Chancellor Kent, in the first four editions of his "Commentaries," lays down the law that "the contract, if it be made *per verba de presenti* and remains without cohabitation, or if made *per verba de futuro* and followed by consummation, amounts to a valid marriage." But in the fifth and subsequent editions, in consequence of the division of opinion in the supreme court, he adds to the words above quoted, "in the absence of all civil regulations to the contrary." But these words leave the precise question in absolute uncertainty, for "regulations" of marriage of some kind exist in every civilized community, and the only question is: Is a marriage valid by consent or contract only, without any regard being paid to these regulations? There are in some cases *obiter dicta* to the effect that such a marriage is valid; but of course they are not authoritative like direct decisions; and even the *dictum* in the case last cited has been subsequently contradicted by higher authority. In Massachusetts, the supreme court has unequivocally declared such marriages illegal and invalid. Nor are we aware of a single case, in England or in this country, in which a widow has been allowed dower, or a child his inheritance, on the ground of the validity of a marriage resting on nothing but the

consent of the parties. As evidence of a regular marriage, reputation, cohabitation, acknowledgment and reception by the family, and other similar circumstances, are always receivable. On the other hand, cases for breach of promise of marriage are very frequent; in most of them seduction or cohabitation is shown; and if it appeared to the court that there had been also a regular marriage, the action would be stopped at once, on the ground that no action can be maintained between husband and wife. If therefore it is permitted to go on, as it always is, after evidence of the agreement of marriage and subsequent cohabitation, it follows that these are not the equivalent of a regular marriage; and this we believe to be the law.—In all our states certain marriages are prohibited, and would of course be void; as those between parties within a certain near lineal consanguinity; and those between parties within the age of consent, which is, for the most part, 15 for the man and 10 for the woman. (For marriages void for fraud or incapacity, see *Drvoxor*.) In many of the states there is now a just and wise provision that a marriage duly solemnized to all appearance shall not be made void by any want of formality, if it be consummated with a full belief on the part of both or either of the parties that they were lawfully married. But this provision, it may be remarked, would be wholly unnecessary if a marriage made by the contract of the parties was complete and valid. The same thing may be said of the statutory provisions permitting the marriages of Quakers to be solemnized after their own fashion.—Contracts to marry at a future time are recognized by law, and actions for the breach of them are, as we have said, very common; and the rules of law in relation to them are, in some respects, peculiar. The promises must be reciprocal, and a woman is bound by such a contract as much as a man. Nor is there any thing in the law to prevent an action by the man for a breach of this contract; but such actions are not common, and would not be favored by court or jury. The action may be brought by an infant, but not against one. The very words, time, and manner of the promise are not often provable, and are never indispensable; for precise and direct testimony to the promise is not demanded. Indeed, courts have, in some instances at least, gone quite far enough in instructing or permitting a jury to infer a promise of marriage from rather slight indications. In general, however, language used to third persons, expressive of a purpose, or even a promise, to marry the plaintiff, does not prove this promise, unless it was addressed to a parent or to one who stood in the place of a parent. This contract, like every other, may be on condition; and if the condition be reasonable, the law will respect it, and will not sustain an action on the promise unless the condition be performed. The defences to such an action are, generally, either a denial of the promise, or if that be proved, any thing which would make the marriage unlawful. But a previous and existing marriage

of the defendant, although it would have made his marriage with the plaintiff illegal and void, would not be a defence against this action, if it were unknown to the plaintiff when the agreement to marry was made by her. The defence most usually relied upon is a denial of the promise; and after that, the bad character of the plaintiff. If this be made out, it is a sufficient defence; but if it be attempted and fails, it is quite well settled that the attempt may be regarded by the jury as a ground for increasing the damages against the defendant. If the defence be a specific criminal act, it must be proved specifically. If it be general bad character, evidence of bad reputation is receivable. Neither specific bad conduct nor general bad character constitutes a defence, if they were known to the defendant when he made his promise; although, even then, they might be considered in mitigation of damages. As matter of law, the weight of authority is against permitting the fact of seduction to be received in evidence in an action for breach of contract to marry, for the purpose of swelling the damages. But it is sometimes directly received, and generally finds its way into the case; and the question of damages is in this case, more than in most others, entirely within the discretion of the jury. The action does not survive to the representative of a deceased promisee, nor can it be maintained against the representative of a deceased promisor.—Contracts in restraint of marriage are wholly void, by the policy of the law. Thus no action can be maintained on any promise or obligation not to marry; as not to marry any woman but the promisee; or by a widow not to marry again; or a promise not to marry within 6 years. There is also a class of contracts, which, from the frequency with which they appear in English law books, would seem to be not uncommon in that country, and which are called "marriage brokerage (sometimes brocage) contracts." They are, in general, contracts for the payment of money or transfer of property to some person, by way of compensation for his or her procuring a marriage for the party paying. Such a contract is declared void in England, on grounds of morality and the public good, without any reference to the expediency or propriety of the marriage itself. We are not aware that any action founded upon such a contract has ever come before the courts of this country; but we think that such an action would be defeated here as in England.

MARRIAGE SETTLEMENTS. A promise to give or advance to a woman, or settle upon her, money or an estate, on her marriage, is valid; because the marriage is regarded by the law as a fully sufficient consideration for it. But it must be made in writing and signed, under the English statute of frauds, and wherever that clause is reenacted here. A mere representation concerning the pecuniary condition of a party, if made in good faith, will not bind one to make his representations good. Letters from parents or relatives, when sufficiently specific,

are held to bind them.—Contracts in fraud of marriage settlements, and intended to defeat them, are void; as a private bargain with the husband, or the husband and wife, that he shall pay back part of her fortune; or a promise to restore money lent to give the appearance of wealth, and so procure the marriage; and a note given only to be exhibited and used for the same purpose has been held valid against the promisor. A creditor who conceals or denies his claims, so that the debtor may obtain the consent of the woman or her guardians, is bound by his denial or concealment as effectually as by a release.—As to the power of an infant, especially a female infant, to make a valid settlement of property in view of marriage, the law is not quite settled. An infant of either sex may certainly receive property in such a way; but in an important case in England (18 Vesey, 259), Lord Chancellor Eldon held that a female infant was not bound by her settlement of her estate, but, when she came of age, might annul the settlement and return into possession of all her rights and interests. We apprehend that in this country any such case would come before a court of equity, which would deal with it according to its merits. If the settlement were imprudent, oppressive, or injurious, although not dishonest, the court would find in the infancy of the maker sufficient authority to annul it; but if it were in itself unobjectionable, we do not believe that it would be interfered with.

MARROW, a peculiar soft, fatty substance, contained in a membrane of extreme delicacy, which fills the medullary canal of the long bones. The medullary membrane, or internal periosteum, is composed of minute vessels ramifying in a fine areolar tissue, whose existence may be easily seen in any well boiled bone; it sends numerous prolongations into the substance of the marrow, giving this its consistence, and supporting the fat vesicles in its cellular network. The fat vesicles, compared by Monro to clusters of pearls, do not communicate with each other; a fine artery runs to each, with an accompanying vein, and doubtless with numerous absorbents and nerves; the main vessel enters a special foramen near the middle of the shaft of the long bones. Marrow is found, not only in the medullary canal, but in the cells of the spongy ends of the long, in the areolæ of the short, and the diploë of the flat bones, and in the longitudinal pores of the compact tissue everywhere. The medullary membrane, when inflamed, may be possessed of an exquisite sensibility, but in ordinary cases it is not very sensitive; persons rarely complain, as the popular belief would lead one to suppose they would, when the marrow is lacerated by the saw during amputation of a limb, but they sometimes do when the operation is performed below the foramen where the nerve enters. There is no marrow nor medullary cavity in the cartilage which precedes bone; an artery first appears, and then a membrane containing a reddish watery substance free from fat; the true marrow succeeds.

becoming more abundant and more fatty with advancing years, resuming its watery character in old age and in lingering disease. The medullary membrane supports the vessels before they enter the osseous tissue, and its extensive destruction is followed by the death of the bone. The fatty substance is not essential to the existence of the bones; it fills up a cavity destined to be free from calcareous matter, and may be absorbed into the system in case of need. Marrow is not found in young mammals, nor in adult birds; fishes, amphibians, and most reptiles have no medullary cavity, but the crocodile and some lizards have considerable cavities; mammals are like man in this respect, though the aquatic genera either have no medullary cavity, or a very small one filled with fluid oil; the marrow of herbivora is harder than that of carnivora, and is a palatable and nutritious article of food; the marrow of the ox, the bear, and other animals, forms the basis of many preparations for promoting the growth of the hair.

MARRYAT, FREDERIC, a British naval officer and author, born in London, July 10, 1792, died in Langham, Norfolk, Aug. 2, 1848. He entered the naval service at 14 years of age as a midshipman on board the frigate *Impérieuse*, commanded by Lord Cochrane, since earl of Dundonald, with whom he served 3 years, and participated in 50 engagements of more or less importance; in one he was so severely injured that he was left for dead, and was only roused to consciousness by the insulting conduct of a fellow midshipman with whom he was at enmity. He also distinguished himself on several occasions by leaping overboard and rescuing drowning shipmates, for which he subsequently received a medal from the humane society. In 1812-'15 he served on the North American coast, and participated in an action with gun boats on Lake Pontchartrain shortly previous to the battle of New Orleans. During the next 10 years he was employed on various naval stations, and for his gallant conduct in the Burmese war was several times thanked by the governor-general of India and the commander-in-chief of the British forces. In 1829, while commanding the *Ariadne* in the channel service, he commenced his literary career by the publication of "Frank Mildmay, or the Naval Officer," a novel of sea life, in which many of his early adventures are related. Among his other productions, which followed in rapid succession, may be mentioned the "King's Own," "Peter Simple," "Jacob Faithful," "Japhet in Search of a Father," "Midshipman Easy," "Snarleyyow," "The Poacher," "Poor Jack," "Masterman Ready," &c., all of which abound in adventure, often of the most ludicrous character, and are written with a thorough knowledge of seamanship. In 1837 he published a "Code of Signals for Vessels employed in the Merchant Service," which has been adopted in England and other countries, and for which he received the cross of the legion of honor from Louis Philippe; and in 1839, after a tour in the United States, appear-

ed his "Diary in America," in 2 series of 8 vols. each. During the last 2 years of his life he was compelled by the rupture of several blood vessels to desist from all professional and literary labor.—SAMUEL FRANCIS, son of the preceding, born in 1826, died in London, July 12, 1855, served several years in the British navy, but resigned his commission, and in 1850 established himself in California. In 1853 he returned to England, and 2 years later published an account of his adventures under the title of "Mountains and Mole Hills" (London, 1855).

MARS, the Roman god of war, whose name in the Sabine and Oscan tongues was Mamers, and who was early identified with the Greek Ares. Before this identification he seems to have been an agricultural rather than warlike divinity. He was one of the three tutelary gods, to each of whom Numa was said to have appointed a flamen, and he enjoyed the highest honors after Jupiter. He was called Father Mars (*Marspiter*), being regarded as the parent of the Romans from having begotten the founders of Rome by Rhea Silvia, a priestess of Vesta. He was distinguished as Gradivus, Silvanus, or Quirinus, in his relations respectively to war, agriculture, and the state. The rites of his worship, as the dances of the Salii in armor, had reference to war and victory. The principal temples dedicated to him at Rome were that on the Appian way outside of the Porta Capena, and that of Mars Ultor in the forum. (See ARES.)

MARS, THE PLANET. See ASTRONOMY.

MARS, ANNE FRANÇOISE HIPPOLYTE BOUTET, a French actress, born in Paris, Feb. 9, 1773, died March 20, 1847. She was the natural offspring of Jacques Monvel, one of the first actors of the day, and a provincial actress named Mars-Boutet, and made her appearance upon the stage when quite a child. At 14 years of age she filled what the French call *rôles d'ingénues*, and when somewhat older, by the advice of Mlle. Contat, then the leading actress in comedy, attempted with success *jeunes amoureuses*. In this department she reached the first place, but made no decided impression upon the public until her personation in 1808 of a deaf and dumb girl in the *Abbé de l'Épée*. The grace and feeling which she evinced on this occasion created an enthusiasm in her favor, and thenceforward so rapid was her advance in the public favor, that soon after the retirement of her friend and instructress Mlle. Contat in 1809, she assumed the position of the first comic actress of the day. For the last 30 years of her professional life she was without a rival on the French stage in genteel comedy, every new part attempted by her being a success down to that of Mlle. de Belle-Isle in Dumas' drama of that name, produced in 1839, in which, although past 60 years of age, she showed so much grace and animation, and so skilfully concealed the ravages of time, as to appear like a young woman of 20. She took her leave of the stage on the night of March 7, 1841, in the *Misanthrope* of Molière and the *Fausse confidences* of Mari-

vaux. Although some of her greatest triumphs were achieved in the plays of Victor Hugo, Dumas, and other modern writers, she greatly preferred the dramas of the old school, especially the comedies of Molière and the *pièces d'intrigue* of Marivaux. Her personations of the fashionable lady or coquette of the old régime in these works are among the most cherished traditions of the French stage. Her figure, voice, action, and toilette were alike admirable, and in the expression of her countenance she invariably conformed to the spirit of the scene. She amassed a considerable fortune by her professional labors, and the latter years of her life were passed in a sumptuous retreat, where she daily received visits from persons eminent in literature or the arts. She left an estate valued at 800,000 francs to a son born 50 years previous to her death, and whom during the greater part of that time she had persistently refused to see.

MARSALA (anc. *Lilybæum*), a fortified seaport town at the W. extremity of Sicily, adjacent to Cape Boëo (anc. *Promontorium Lilybæum*), in the province of Trapani, 16 m. S. S. W. from the town of Trapani, in lat. 37° 48' 10" N., long. 22° 25' 10" E.; pop. about 20,000. It contains a cathedral, 16 churches, and various monastic, educational, and charitable establishments. It exports corn, cattle, oil, salt, and soda, but chiefly wine, to which it owes its importance. An English mercantile house was established there in 1789 to prepare the wine of the surrounding country (being a light white wine resembling that of Madeira) for exportation; but it did not come into much repute until 1802, when by order of Lord Nelson it was supplied to the Mediterranean fleet. There are now several English houses engaged in the wine business in Marsala, and about $\frac{2}{3}$ of the entire product, which is estimated annually at 30,000 pipes, is annually exported to Malta, England, the United States, and other foreign countries.—The ancient city of Lilybæum, of which Marsala occupies only the southern half, was founded by a colony of Carthaginians who escaped from the destruction of Motya by the elder Dionysius in 397 B. C. It prospered rapidly, and became the chief bulwark of the Carthaginian power in Sicily. In 276 B. C. Pyrrhus of Epirus made an unsuccessful attempt to capture it; and in 250 it was attacked by the Romans in the first Punic war with two consular armies and a formidable fleet. After several efforts to carry it by assault, the consuls converted the siege into a blockade, which was maintained for nearly 10 years without accomplishing its object; nor did the Romans obtain possession of it until it was surrendered by the Carthaginians at the conclusion of the war in part purchase of peace. From this period the harbor of Lilybæum became a principal station of the Roman fleet, and the city one of the great points of communication between Rome and Africa. The place continued prosperous even till the 16th century; but from the period when the emperor Charles

V. caused its harbor to be blocked up with a mound in order to protect it from the attacks of the Barbary corsairs, it ceased to hold the first rank among the maritime towns of W. Sicily, and gave place to Trapani. Few vestiges of the ancient city now remain. Numerous fragments of sculpture, however, vases, coins, &c., have been from time to time discovered, and some portions of an aqueduct are still standing. Marsala was Garibaldi's landing place in his expedition to Sicily in May, 1860, where he disembarked in presence of two Neapolitan war steamers.

MARSDEN, WILLIAM, a British orientalist, born in Dublin, Nov. 16, 1754, died near London, Oct. 6, 1836. In 1771 his father, who was a prominent merchant of Dublin, procured for him an appointment in the civil service of the East India company at Bencoolen, Sumatra. He there attained the office of principal secretary to the government, acquired a close acquaintance with the country and the Malay language, and in 1779 returned to England, where for some years he led a very retired life, occupied chiefly with historical and philological researches. In 1795 he was made under secretary to the admiralty, and afterward chief secretary, with a salary of £4,000; and on his resignation on account of ill health in 1807, the government conferred on him a pension of £1,500, which he surrendered, however, in 1831. Mr. Marsden was a member of nearly all the learned societies of the kingdom. In 1834 he bequeathed his rich collection of coins and medals to the British museum, and his valuable library of oriental books and MSS. to King's college, London. The most important of his works are: "History of Sumatra" (London, 1782); "Grammar and Dictionary of the Malay Language" (1812); a translation of the travels of Marco Polo (1817); and *Numismata Orientalia*, a treatise on eastern coins, &c. (1828-'5).

MARSEILLAISE, a national song of France, composed in 1792 by Rouget de l'Isle, an officer then stationed at Strasbourg, for a corps of volunteers who joined the army of the Rhine, and hence originally called *Chant de guerre de l'armée du Rhin*. Its success was so great that the corps immediately gained an accession of 800 men. It soon attained popularity throughout the country, and by its inspiring effect it is believed to have greatly contributed to the victories of the French revolutionary armies. In Paris it was sung for the first time by the band of men who were brought from Marseilles by Barbaroux to aid in the revolution of Aug. 10, 1792. Hence it was called *Le chant des Marseillais*, and afterward *La Marseillaise*. It has since continued to be the favorite song during all popular movements in France.

MARSEILLES (Fr. *Marseille*; anc. *Massilia*), the principal seaport of France, capital city of the department of Bouches-du-Rhône, on the N. E. shore of the gulf of Lyons, at the head of a bay the entrance to which is sheltered by a group of islets, in lat. 43° 17' 48" N., long. 5°

22' 15" E., 594 m. by railway S. S. E. from Paris; pop. of the arrondissement in 1856, 270,499; of the city, 215,196. It is connected by railway with the principal cities of France, by steamers with the chief ports of the Mediterranean, the Levant, and Algeria, and is the centre of the Indian overland mail service. On its N. side lies the old town, with filthy and tortuous streets and lanes, but containing some spacious squares, a remarkable town hall, and the remains of Roman ramparts. It is separated from the new town by a magnificent avenue, which is successively called Rue d'Aix, in its central part Rue du Grand Cours, and afterward Rue de Rome, and which extends in a straight line from the gate of Aix to that of Rome, traversing the entire length of the city from N. to S., and leading to the Prado, the most popular promenade on the seaside. The handsomest of the many fine streets of the new city is the Cannebière, which leads from the Grand Cours to the old harbor, and contains the most elegant shops, hotels, and coffee houses, including the beautiful *Café Turc*, chiefly frequented by Greeks and Levantines. The new city is built around the port. The quays are the most bustling and interesting parts of Marseilles, being constantly thronged by crowds of turbaned orientals, Greeks, Italians, English, and French, who are engaged in the business of the place. The animation of the city is only equalled by the picturesqueness of its locality. It rises over its port in the form of a gradually sloping amphitheatre; the surrounding hills are covered with olive gardens and vineyards, and with nearly 6,000 country houses or *bastides* of the citizens. Opposite the mouth of the harbor is the château d'If, in which Mirabeau was imprisoned. On summer evenings the inhabitants seek relief from the heat on the seaside, which is crowded with pleasure boats; and many fine residences and places of public entertainment are situated along the banks. All parts of the city are well supplied with water through a canal fed by the Durance, and opened in 1850, at a cost of \$10,000,000. The public buildings of Marseilles possess little architectural interest. The cathedral is said to have been built upon the site of a temple of Diana; the church of St. Victor is the most ancient church, and was formerly one of the most celebrated abbeys in Christendom. There is a French Protestant church, a place of worship for the English residents, a Greek church, and a synagogue.—Among the public institutions are an arsenal, a mint, a lyceum, a medical school, a hydrographic institution, a school for instruction in Arabic, an industrial and commercial academy, a fine observatory, a museum of pictures, antiquities, medals, and natural history, a library of nearly 200,000 volumes, a botanic garden, an academy of sciences, letters, and art, medical, agricultural, and statistical societies, and a number of newspapers, the best known of which is the *Sémaphore de Marseille*. The Grand theatre resembles the Odéon of Paris. Beside the Hô-

tel Dieu, there are a lunatic asylum, a lying-in hospital, several public institutions for the relief of the poor, a school for deaf mutes, and other public and private charitable establishments. The lazaretto, which was so large that it could hold the entire French army on its return from Egypt, was pulled down in 1850 and removed, as well as the sanitary department, to the quarantine roadstead of Frioul, which was formed by connecting the fortified islets of If, Pomègue, and Ratonneau by means of a breakwater.—The old harbor is an oblong basin 1,000 yards long by 330 broad, occupying an area of about 70 acres, has a depth of water varying from 18 to 24 feet, and can accommodate 1,200 merchant vessels. It is protected on the right by Fort St. Nicolas, and on the left by Fort St. Jean. On its N. is the new harbor, La Joliette, which was completed in 1855. It is formed by a breakwater 1,800 yards long, thrown into the sea parallel to the shore, and at a distance of 1,800 feet from it; two piers stretch toward it from the shore, at a distance of 600 yards from each other, so as to leave room for the entrance of vessels. It forms an inner basin and two outer harbors, and the former is connected with the old port by a canal, which runs behind the fort of St. Jean. The inner basin and this canal cover an area of about 70 acres. The foreign shipping comprises annually about 10,000 entrances and clearances, with about $\frac{1}{4}$ of the whole tonnage of France. Nearly as many vessels are engaged in the coasting trade. The registered shipping amounts to about 1,000 sailing vessels and over 100 steamers. The aggregate annual value of the imports and exports exceeds \$200,000,000. Marseilles is the principal grain depot of the Mediterranean. In 1857 the importation of wheat amounted to 10,007,348 bushels, maize 1,580,227, rye 511,744, barley 768,400, and oats 1,787,500; total, nearly 15,000,000 bushels. The exports to New York in 1858 employed 28 and to Boston 16 vessels, containing cargoes of olive oil, madder, garancine, soap, cream of tartar, almonds, lead, corks, and wine. Marseilles trades with all parts of the world, but chiefly with the Levant, Algeria, and other coasts of the Mediterranean. The branch of the bank of France at Marseilles discounted in 1859 bills of exchange to the extent of nearly \$100,000,000. The custom house receipts in 1858 were equal to those of Havre, namely, about \$8,000,000, or 19 per cent. of the total receipts of the empire. The annual value of the goods manufactured in the arrondissement of Marseilles is about \$25,000,000. The principal of these are soap, morocco and other leather, glass, porcelain, caps, straw hats, refined sugar, salt, liqueur, &c.—The ancient city was founded about 600 B. C. by Ionian colonists from Phocæa in Asia Minor. The prosperity and the commerce of the new settlement made rapid progress. Massilia became the rival of Carthage and the ally of Rome. Many new settlements were founded by her along the coast of the Mediterranean, and remained under her subjection,

and her navigators advanced as far as the Baltic (about 850 B. C.). Threatened by hostile tribes, the inhabitants of Massilia called the Romans to their assistance (158–125 B. C.). The city was left in possession of its independence after the subjugation of Gaul, but in 48 B. C., having declared for Pompey at the outbreak of the civil war, it was seized by Cæsar and annexed to the Roman republic. Massilia became then celebrated as a seat of learning, and was called the new Athens. Christianity was introduced there in the 3d century. After various vicissitudes the city came in the 9th century under the sway of Boson, king of Arles, and in the 18th under that of the counts of Provence; and in 1481 Marseilles along with Provence was united to the crown of France. In 1524 it resisted the constable de Bourbon. The religious wars were carried on with great bitterness in Marseilles, and the city submitted to Henry IV. only in 1596. It was deprived of its franchise by Louis XIV. in 1660. In 1720 it was desolated by the plague, which destroyed 40,000 or 50,000 persons, on which occasion Bishop Belzunce distinguished himself by his zeal for the sick; a monument perpetuates his memory, and the poet Pope has celebrated his heroism. During the French revolution, the city declared itself in favor of the Girondists, but it was taken by the terrorists. Schlosser says: "Fréron erected a revolutionary tribunal without a jury in Marseilles, and selected the refuse of humanity for his judges. It almost appeared as if the commissioners of the convention would annihilate the city itself and even the harbor. Executions were of daily occurrence, and the destruction of buildings continued for months, while Fréron dated his reports to the convention, according to the savage style of his time, not from Marseilles, but from 'commune unnamed.'" It was only after the restoration of the Bourbons that Marseilles fully recovered from these calamities. The population has since doubled, and the colonization of Algeria has given a powerful impetus to its commerce.

MARSH, ANNE (CALDWELL), an English authoress, born in Staffordshire toward the close of the last century. Upon being married to Mr. Marsh, a junior member of a banking firm in London, she took up her residence in that city, and for many years devoted herself exclusively to domestic duties and the care of her children, appearing for the first time as an authoress with the publication of her "Two Old Men's Tales" in 1834. This work, which was favorably received, like the two succeeding ones, "Tales of the Woods and Fields" and "Triumphs of Time," was published anonymously. In 1843-'6 appeared her two most popular novels, "Mount Sorel" and "Emilia Wyndham," followed by "The Protestant Reformation in France," "Father Darcy," "Norman's Bridge," "Angela," "Mordaunt Hall," "Lettice Arnold," "The Wilmingtons," "Time the Avenger," and others.

MARSH, DEXTER, an explorer of the fossils of the Connecticut valley, born in 1806, died in Greenfield, Mass., in April, 1858. Without education, and by occupation a day laborer, his attention was first attracted to the subject of fossils by observing in 1835 the footprints in slabs designed for flagging stones. He was early engaged in the search for specimens, sometimes in the employ of others, but in later years chiefly on his own account, traversing the valley from the northern line of Massachusetts to Weathersfield, and visiting also the states of New Jersey and New Hampshire. The combination of much judgment in the selection of localities where footprints were likely to be found, and skill in the practical excavation of slabs, with great powers of physical endurance, made him most successful in procuring specimens; so that, at the time of his death, notwithstanding his frequent supplies to others, his cabinet contained, as the result of his own personal exertions, perhaps the choicest collection of fossil footprints and fishes then in existence. Among them were impressions, supposed to be quadrupedal, so small that a half dime would more than cover them; and others, measuring 14, 16, and in one instance over 18 inches in length, which were supposed to have been made by birds. One slab, 10 feet in length by 6 in width, contained at least 70 distinct footprints; and another, 7 feet by 4, was literally covered with perfect impressions. There were in all about 500 slabs with tracks and raindrops impressed upon them, and 200 specimens of fossil fishes, beside a large quantity of beryls obtained by Mr. Marsh at Acworth, N. H., during the last summer of his life, and many choice minerals and other objects of scientific interest. After his death the whole collection was sold by auction for about \$2,700. The best specimens were bought by Mr. Francis Alger of Boston, the Boston society of natural history, and Amherst college. For the largest single slab, which is the finest yet successfully excavated, the sum of \$375 was received.

MARSH, GEORGE PRENTISS, LL.D., an American philologist, born in Woodstock, Windsor co., Vt., March 17, 1801. He was graduated at Dartmouth college in 1820, and then removed to Burlington, Vt., where he studied law and was admitted to the bar. In 1835 he was elected a member of the supreme executive council of Vermont, and in 1842 became a representative in congress, retaining his seat in that body by successive reelections until 1849, when he was commissioned by President Taylor as minister resident at Constantinople, which office he held for 4 years. In 1852 he was charged by the U. S. government with a special mission to Greece. During his residence abroad, he travelled extensively in the East and in Europe, passing some time in Denmark, Sweden, and Norway, where he has long been recognized as a leading Scandinavian scholar. Since his return from Europe in 1853 he has been appointed one of the commissioners to rebuild the state house at Montpelier, which was burned in

Jan. 1857, and has served as railroad commissioner for Vermont for two years (1857-'59). In 1857 he was appointed by the governor of Vermont to make a report to the legislature in regard to the artificial propagation of fish. In 1844 he was chosen one of the corporation of the university of Vermont, of which body he is still a member. Beside numerous addresses and speeches, and contributions to periodicals, he has published a "Compendious Grammar of the Old Northern or Icelandic Language, compiled and translated from the Grammar of Rask" (Burlington, 1838); "The Camel, his Organization, Habits, and Uses, considered with reference to his Introduction into the United States" (Boston, 1856); and "Lectures on the English Language" (New York, 1860; originally delivered in 1859 in the post-graduate course of Columbia college, New York), in which he "aimed to excite a more general interest among educated men and women in the history and essential character of their native tongue, and to recommend the study of the English language in its earlier literary monuments rather than through the medium of grammars and linguistic treatises." In 1860 he received from Dartmouth college the degree of LL.D. He resides at Burlington, and is constantly occupied with literary labor and philological researches. He is a collaborator in the dictionary of the English language now in preparation under the auspices of the London philological society.—**CAROLINE (CRANE)**, wife of the preceding, born in Berkley, Bristol co., Mass., Dec. 1, 1816. She was married in 1838. Her published productions are: "The Hallig, or the Sheepfold in the Waters," translated from the German of Biermatzki, with a biographical sketch of the author (Boston, 1857); and "Wolfe of the Knoll and other Poems" (New York, 1860).

MARSH, HERBERT, D.D., an English prelate and author, born in London in 1757, died in Peterborough in 1839. He was educated at St. John's college, Cambridge. In 1788 he went to Germany, and resided for several years in Göttingen, where he published in German a series of pamphlets in defence of the war policy of Great Britain, for which Mr. Pitt rewarded him with a pension. On the French invasion of Germany he returned to England, and in 1807 was appointed Lady Margaret's professor of divinity at Cambridge. In discharging the duties of this office, he made an important departure from the practice of his predecessors, by substituting English for Latin in the delivery of his lectures. In 1816 he was raised to the see of Llandaff, and 3 years subsequently was translated to Peterborough. He was one of the first to introduce into England the biblical criticism of Germany, and was a distinguished opponent of both Calvinists and Roman Catholics. His principal works are: a translation of Michaelis's "Introduction to the New Testament" (London, 1792-1801); "The Authenticity of the Five Books of Moses considered" (4to., Cambridge, 1792); "The National Religion the

Foundation of National Education" (8vo., 1811); "Lectures on the Criticism and Interpretation of the Bible" (8vo., 1838); and "Lectures on the Authenticity and Credibility of the New Testament, and on the Authority of the Old Testament" (new edition, 1840).

MARSH, JAMES, D.D., an American scholar and philosopher, born in Hartford, Vt., July 19, 1794, died in Colchester, Vt., July 8, 1842. He was the son of an intelligent farmer, and grandson of one of the most prominent early settlers of Vermont, who was for several years lieutenant-governor of the state. The first 18 years of his life were passed in rural labors, which continued to have so strong a charm for him that even after completing his professional studies he entertained the project of retiring permanently to his father's farm. Taking the place of an elder brother, who had been destined for college but diverted from the purpose, he prepared himself at the academy in Randolph, and was admitted to Dartmouth college in 1818. He was intent upon general scholarship, but exhibited a preference for the ancient languages and literature, especially for the Greek, which he never ceased to study and admire. In 1815, during a period of unusual interest in religion shared by most of the students, occurred a change in his views and feelings which he regarded as the commencement of his regenerate life. Inclined to theology by a sense of duty and by the native bent of his mind, he entered the seminary at Andover immediately after his graduation in 1817. After remaining one year, he returned to Dartmouth as tutor, which office he filled two years, at the same time vigorously pursuing a wide range of studies. A literary club was formed, which he afterward esteemed one of his best schools of discipline. Resuming his course at Andover in 1820, he visited Cambridge by the way, hoping thereby "to learn how to defend my religious principles with more enlarged views, and on more philosophical grounds." At Andover he regularly prosecuted the study of the modern languages, explored the then almost new field of German erudition, began to make acquaintance with Kant's "Critique of Pure Reason," undertook to read through the works of Plato, making a copious analysis of each dialogue, appreciated Wordsworth and Coleridge, and aimed to systematize his various acquirements by introducing a principle of unity. During his last year at Andover he wrote an article for the "North American Review" on ancient and modern poetry, contrasting the genius of the ancients and the moderns, and with a friend began to translate from the German Bellermann's work on the geography of the Scriptures. The intensity of his application affected his health, and a few months before completing his course he made a tour to the South, visiting New York, Princeton, and Philadelphia. Several positions as professor or editor were sought for him, while he was at home finishing the translation of Bellermann. His habits as a student had conveyed an im-

pression that he was wholly given to books and speculative inquiries, and was not sufficiently attentive to more practical duties. His aversion to every thing merely formal and outward in religion added to this impression. He suggested that conference meetings might be made more profitable by changing them into a kind of a religious levee; and though he excelled in conversational discussion in a small and congenial circle, he was thoroughly disinclined to preaching, and regarded his mental habits and tendencies as incompatible with it. After a season of hesitation and projects, he became a professor in Hampden Sidney college, Va., giving a portion of his time to the adjacent theological school. The department of oriental languages was ultimately expected for him. He was ordained and married at Hanover in 1824, and on returning to his duties began his translation of Herder's "Spirit of Hebrew Poetry," the first parts of which appeared in the "Christian Repository" at Princeton. In 1826 he was appointed to the presidency of the university of Vermont, and important changes in the collegiate system were immediately due to his suggestion. He held that the requirements for admission were too strict, that the course of study and recitation did not allow sufficient latitude for individual inclinations and tendencies, that the modes of instruction were too formal and too much attached to text books, and that morals and character were too exclusively judged by the observance of minute regulations. He urged a freer and more parental discipline, and that the standard of scholarship should be determined and recorded, not by the routine of recitation, but after a close examination at the end of each year. During his presidency he had charge of the department of metaphysics and ethics, which became his exclusive field of labor in 1833. The practical duties of the presidency he had found irksome, and therefore, in order to devote himself entirely to his favorite studies, he exchanged the place for the professorship of moral and intellectual philosophy. In 1828 occurred the death of his wife, whose sister he subsequently married; in 1829 he contributed a series of articles on popular education to the "Vermont Chronicle," and a review of Stuart's "Commentary on Hebrews" to the "Christian Spectator," the latter containing the germ of his most characteristic writings. He was among the first in this country to revive the scholastic dogma of *Credo ut intelligas*, in opposition to that of *Intellige ut credas*, which the English and Scotch philosophy had made prevalent. About this time he received a copy of Coleridge's "Aids to Reflection," and was struck by the coincidence of the thoughts with his own, and by the adaptedness of the work to the end which he had himself proposed. Leighton also, who was the theme of the "Aids," was one of his favorite authors, and he therefore availed himself of the opportunity to introduce both Leighton and Coleridge to the American public. He wrote a prelimi-

nary essay for his edition of the work (1829), which established his reputation as a scholar and metaphysician, and which was reproduced in London as the introduction to the "Aids," and in New York prefixed to a complete edition of the writings of Coleridge (1858). To advance the cause of spiritual philosophy and promote the growth of a truly spiritual life, he published a volume of selections from the old English divines (1830), containing Howe's "Blessedness of the Righteous" and Bates's "Four Last Things," and in 1833 completed his translation of Herder's "Spirit of Hebrew Poetry," which he believed would be highly advantageous to the formation of correct biblical views. The larger works which he contemplated were but partially executed. The most important of these was a system of logic, the plan of which he drew up in 1832, and as a preparation for which he made a free translation of the German work of Fries on the same subject. He also planned a treatise on psychology, which was to embody his highest speculations. Near the close of his life he committed his papers to Prof. Torrey, of the university of Vermont, who published a volume of "Remains" with a memoir (Boston, 1843). It consists chiefly of his academical philosophical lectures and theological discourses, evincing a profound insight and discrimination, and written in an elaborate and admirable style. His correspondence and minor writings abound in felicitous passages which prove his philosophical genius and culture.

MARSH HEN. See RAIL.

MARSH MALLOW. See ALTHÆA.

MARSH RABBIT. See HARE.

MARSHAL (Fr. *maréchal*; Germ. *Mar-schalk*; mediæval Lat. *marescallus*), a term originally applied to the person who had charge of the horses of the king or other high dignitary. In the middle ages he was the chief officer of arms, and at tournaments regulated combats in the lists; but ultimately the title was borne by both civil functionaries and military officers. In England, until 1849, the marshal of the king's household presided over the knight marshal's court created by Charles I., and which had jurisdiction of personal actions within a circuit of 12 miles around Whitehall. The marshal of the king's bench has the custody of the marshalsea or king's bench prison in Southwark. In the United States, a marshal is an officer of one of the federal judicial districts, having duties similar to those of a sheriff. (See EARL MARSHAL, and FIELD MARSHAL.)

MARSHALL, the name of counties in 8 of the United States. I. A N. W. co. of Va., lying between Ohio and Pennsylvania, and bordered on the W. by the Ohio river; area, 280 sq. m.; pop. in 1850, 10,138, of whom 49 were slaves. It has a hilly surface and fertile soil. The productions in 1850 were 74,976 bushels of wheat, 802,180 of Indian corn, and 88,144 lbs. of wool. There were 18 grist mills, 8 tanneries, 15 churches, and 700 pupils attending public schools. Value of real estate in 1856,

\$2,426,546; increase since 1850, 15 per cent. The Baltimore and Ohio railroad passes through the county. Capital, Elizabethtown. II. A N. E. co. of Ala., intersected by the Tennessee river and drained by its branches and by the head waters of the Black Warrior; area, 600 sq. m.; pop. in 1850, 8,846, of whom 868 were slaves. The surface is mountainous, being traversed by ridges of the Appalachian system, and the soil is generally fertile. The productions in 1850 were 357,201 bushels of Indian corn, 33,240 of sweet potatoes, 2,681 lbs. of rice, and 1,966 bales of cotton. There were 11 churches, and 429 pupils attending public schools. Capital, Warrenton. III. A N. co. of Miss., bordering on Tenn., drained by the Tallahatchie, Tippah, and Coldwater rivers; area, 880 sq. m.; pop. in 1850, 29,689, of whom 15,417 were slaves. It has an undulating surface and fertile soil. The productions in 1850 were 1,286,006 bushels of Indian corn, 266,640 of sweet potatoes, 82,688 lbs. of rice, and 82,775 bales of cotton. There were 15 grist mills, 11 saw mills, 4 tanneries, 38 churches, 3 colleges, and 524 pupils attending schools. The Mississippi central railroad intersects the county, passing through the capital, Holly Springs. IV. A central co. of Tenn., intersected by Duck river; area, about 850 sq. m.; pop. in 1850, 15,616, of whom 8,684 were slaves. It has a diversified surface and a generally fertile soil. The productions in 1850 were 1,291,675 bushels of Indian corn, 161,727 of oats, 42,192 of sweet potatoes, 60,757 lbs. of tobacco, 84,544 of wool, and 1,054 bales of cotton. There were 6 grist mills, 6 saw mills, 5 tanneries, 35 churches, and 2,971 pupils attending public schools. Capital, Lewisburg. V. A W. co. of Ky., bounded N. and E. by the Tennessee river and intersected by Clarke's river; area, about 850 sq. m.; pop. in 1850, 5,269, of whom 249 were slaves. It has an undulating surface and fertile soil. The productions in 1850 were 192,885 bushels of Indian corn, 27,454 of oats, 122,833 of tobacco, and 6,519 lbs. of wool. There were 2 grist mills, 2 saw mills, 2 tanneries, 16 churches, and 720 pupils attending public schools. Capital, Benton. VI. A N. co. of Ind., drained by the Yellow and Tippecanoe rivers; area, 440 sq. m.; pop. in 1850, 5,848. It has a level surface and fertile soil. Iron ore abounds. The productions in 1850 were 168,080 bushels of Indian corn, 51,435 of wheat, 28,827 of oats, and 18,586 lbs. of wool. There were 3 grist mills, 3 saw mills, 2 tanneries, 4 churches, and 860 pupils attending public schools. The Pittsburgh, Fort Wayne, and Chicago, and the Cincinnati, Peru, and Chicago railroads form one line from the E. and branch to the W. from the capital, Plymouth. VII. A N. central co. of Ill., intersected by the Illinois river; area, 445 sq. m.; pop. in 1855, 9,900. It has an almost level surface and fertile soil. The productions in 1850 were 104,469 bushels of wheat, 46,990 of oats, and 392,317 of Indian corn. There were 4 grist mills, 2 saw mills, 5 churches, and 800

pupils attending public schools. Capital, Lacon. VIII. A central co. of Iowa, intersected by Iowa river; area, 576 sq. m.; pop. in 1859, 5,718. It has an undulating surface and fertile soil. The productions in 1859 were 84,515 bushels of Indian corn, 25,287 of wheat, 88,182 of oats, 22,323 of potatoes, 3,874 tons of hay, 105,513 lbs. of butter, and 9,170 galls. of sorghum molasses. Capital Marietta.

MARSHALL, the capital of Calhoun co., Mich., on the right bank of the Kalamazoo, at the mouth of Rice creek and on the Michigan central railroad, 107 m. from Detroit; pop. in 1850, 2,322; in 1860 estimated at 4,000. It contains many mills and manufacturing establishments, 10 churches (9 Protestant and 1 Roman Catholic), and a number of schools.

MARSHALL, CHARLES KIMBALL, D.D., an American clergyman, of Huguenot ancestry, born in Durham, Me., Aug. 29, 1812. He twice interrupted his school studies to work in a printing office and at other mechanical trades, and in 1829 went to New Orleans, where he engaged in business. He spent a short time at Woodward college, Ohio, and, after again applying himself to business pursuits in New Orleans, accepted an invitation to fill the pulpit of the Methodist church in Natchez, Miss., having previously been licensed to preach. He soon became one of the most prominent ministers in the state, took an active interest in its agricultural, moral, and educational development, was the author of the Mississippi temperance law, and has been conspicuous as an advocate of the policy of excluding from southern schools all text books which betray hostility to southern institutions. He now resides in Vicksburg.

MARSHALL, JOHN, an American jurist, born in Fauquier co., Va., Sept. 24, 1755, died in Philadelphia, July 6, 1835. He was the eldest of 15 children of Col. Thomas Marshall, a planter who signalized himself during the revolution, especially at the battle of Brandywine, where his regiment bore the brunt of the British assault, led by Cornwallis in person. The maiden name of his mother was Mary Keith. The region in which he was born was at that time very thinly settled; the people were primitive and simple in their modes of life; and the facilities for the education of youth were extremely limited. This fact, operating with a narrow fortune, made it impossible for Col. Marshall to give his numerous children a thorough education; but he supplied this want by devoting himself personally to their training. He seems to have been a gentleman of culture, with a strong taste for the English classics; and we have the testimony of Judge Marshall that "he was a far abler man than any of his sons." "To him," he added, "I owe the solid foundation of all my own success in life." Col. Marshall implanted in the youth a strong love of English literature, especially for poetry and history; and this fondness, thus early acquired, accompanied him throughout life. At the age of 12 he had transcribed Pope's "Essay on

Man," and other poems by the same author, and knew by heart a large portion of his writings. Milton, Shakespeare, and Dryden were also then and afterward his favorite reading; and his admiration of them led him to indulge in frequent poetical compositions, none of which, however, seem to have been published. At the age of 14 he was sent to Westmoreland, and placed at the school of the Rev. Mr. Campbell, where he was instructed in English and Latin. At this school James Monroe was one of his fellow students. Returning home at the end of a year, he resumed his studies under the direction of a Scottish clergyman, the Rev. Mr. Thompson. His hours were however still largely devoted to his favorite poets, and many proofs remain of the fact that at this time, and for many years afterward, the future chief justice was full of dreamy romance and poetical enthusiasm. He would wander deep into the woods, and indulge in solitary meditations, or rising early seek some hill from which he could see the beauties of sunrise. Field sports and athletic exercises in the open air were also habitual with him; and in these pursuits he acquired that physical strength of constitution which enabled him to endure the enormous amount of labor which his subsequent official career involved. The surroundings of the youth were eminently calculated to develop the traits of character necessary in a great republican judge. Every thing was natural, truthful, and unartificial at the plain old homestead. Col. Marshall ruled his large household with the kindness and simplicity of a patriarch; and instilled into the minds of his children principles of truth, faith, and uprightness, which shaped their characters and directed their entire careers. John Marshall was intended for the law, and commenced the study of the profession at the age of 18; but the impending struggle with Great Britain drew him away from his books before he had obtained a license to practise. The year 1775 came, and a vague presentiment of the approach of important events filled every mind. The war spirit began to agitate the youths of Virginia, and young Marshall partook of the general sentiment. He joined a military company in his neighborhood, applied himself with ardor to the drill, and when news came of the battle of Lexington, and the march of Patrick Henry upon Williamsburg, he addressed the company in eloquent terms, and urged them to prepare for every emergency. The call for their services was not long delayed. Dunmore fled from the capital, and Col. Henry sent to the upper counties for volunteers to drive the governor from the soil of Virginia. The response was prompt. Three companies quickly assembled, among whom were the Culpepper "minute men," who wore green hunting shirts, with "Liberty or Death" in white letters on the bosom. Their banner displayed a coiled rattlesnake with the motto: "Don't tread on me." In this company John Marshall was lieutenant; his father was elected major of the

regiment. It marched immediately, and took an important part in the battle of Great Bridge. "Col. Stevens of the Oulpepper battalion," said the "Virginia Gazette," "was sent round to the left to flank the enemy, which was done with so much spirit and activity that a rout immediately ensued." The Oulpepper battalion was Marshall's company, and he was lieutenant of the flanking party, which advanced in face of a murderous discharge from the enemy posted on the causeway, and terminated the engagement. In July, 1776, he was made lieutenant in the 11th Virginia regiment, on continental service, and marched with his company to the north. In May, 1777, he was promoted to a captaincy. From the time of his entrance into the army to the close of 1779, Marshall was in active service. He took part in the engagement at Iron Hill, and in the battles of Germantown, Brandywine, and Monmouth. He shared the hardships and sufferings of the troops at Valley Forge, and his unvarying good humor and sanguine hopefulness cheered his companions in the darkest hours of that terrible winter. "The officers of the Virginia line," we are told, "appeared almost to idolize him." He acted frequently as deputy judge advocate at this period, and secured the warm regard of Gen. Washington. In the winter of 1779 he was sent to Virginia to take command of a new corps to be raised by the legislature. While this subject was under discussion, he attended a course of law lectures delivered by Mr. Wythe at William and Mary college, and Bishop Madison's lectures on natural philosophy. In the ensuing summer he was licensed to practise law, but his military duties drew him back to the army. The project to raise additional forces in Virginia seems to have failed; and the young man set out alone and on foot to make the long journey to head-quarters. On his arrival in Philadelphia, the appearance of the future chief justice of the United States was so shabby and poverty-stricken, that the landlord of the hotel at which he stopped refused him admittance. He continued in the army until after the invasion of Virginia by Arnold in 1781, when, finding a redundancy of officers in the Virginia line, he resigned his commission. This was the end of Capt. Marshall's military career. The surrender of Cornwallis at the close of the year terminated the war; the courts, long silenced by the tumult, were reopened and thronged with advocates; and the young man prepared to enter the arena as an attorney. His success was marked from the commencement. Personally he was very popular. The benevolence, placidity, and sweetness of his temper, which at times changed to a joyous good humor, gained him a host of friends; and "that extraordinary comprehension and grasp of mind, by which difficulties were seized and overcome without difficulty or parade, commanded the attention and respect of the courts of justice." In 1782 he was a member of the house of delegates from Fauquier, and in the au-

turn of the same year was appointed one of the council of state. In Jan. 1783, he was married, at the "Cottage" in Hanover, to Miss Mary Willis Ambler, daughter of Treasurer Ambler, whom he had met at Yorktown soon after the battle of Great Bridge. It is said that after seeing the parson he possessed but a single guinea. His union with this lovely and estimable lady continued for nearly 50 years. He soon afterward resigned his seat in the executive council, but did not return to Fauquier. He fixed his residence in Richmond for the advantages of practice which the place offered, and applied himself with energy to his profession. In spite of his removal from the county, his old neighbors reelected him a member of the house, and in 1787 he sat in the same body as representative from the county of Henrico. A period had now arrived in the history of the country when strong heads and stout hearts were as necessary as in the great struggle of the revolution. The war of swords and bayonets had ended, and the land was free; but a plan of government adequate to the wants of the country had to be adopted, and the paramount question arose whether that government should be a weak or a strong one. The note of battle was sounded in the general assembly during the session when Marshall sat for Henrico, and the friends and enemies of a strong central authority ranged themselves formally under the opposing banners. The Philadelphia convention agreed upon a constitution, and it was submitted for ratification or rejection to the states. In June, 1788, the Virginia convention to act upon the subject assembled, and Marshall was a member of the body. The instrument had been for many months the topic of vehement discussion throughout the commonwealth, on the hustings and in the newspapers; and on the floor of the convention the final struggle was about to take place. Mr. Marshall took a conspicuous stand by the side of James Madison, Edmund Pendleton, and other distinguished advocates of its adoption. His defence of the constitution against its assailants was masterly. He did not speak as frequently as some other members, but on three great occasions—the debates on taxation, on the judiciary, and on the power over the militia—he gave full scope to his powerful logic, and massive faculty of reasoning. The instrument was finally adopted by a vote of 89 to 79. Marshall largely increased his reputation by the part which he had taken in the debates. He was associated with Madison in the public mind; and the two men were justly regarded as having done more for the adoption of the great federal plan of government than any other members of the body. On the adjournment of the convention, Marshall returned to his practice, with the fixed intention to take no further part in public affairs. From this resolution he was however forced to depart. The legislature having directed, in 1788, that thereafter the city of Richmond should be entitled to a representative in the house, Marshall was urgently pressed to be-

come a candidate for the place. The hostility exhibited by the state rights party to the national government, and the necessity of having in the legislature a champion of the federalists, were the grounds of this application, and Marshall reluctantly yielded. He was elected, and continued to sit in the assembly during the sessions of 1789, 1790, and 1791. Throughout this period, the opposing policies of the republicans and federalists were passionately debated in the legislature. Virginia was the head-quarters of the state rights party, whose views were represented in the national cabinet by Thomas Jefferson; and a majority of the people of the commonwealth were opposed to the measures of the administration. The great question whether the U. S. constitution should be strictly or liberally construed was the point at issue; and Marshall advocated the latter view with conspicuous ability. Every measure of the administration was discussed with no little acrimony; and heated passion was often involved in the debates. Marshall supported the federal view with the calmness and moderation of tone which characterized him, but with all the vigor which his friends had expected. When in 1792 he retired from the body, he left not an enemy behind him. He had overthrown many in debate, but never lost a friend. From 1792 to 1795 he devoted himself exclusively to his practice, which had greatly increased. In the next year he appeared prominently in public meetings on the side of the administration of Gen. Washington, and powerfully defended the proclamation of neutrality occasioned by the insolent conduct of Citizen Genet. He advocated the policy of Washington both orally and with his pen; and secured the passage, by a meeting of the citizens, of a set of resolutions approving it, which he had drafted. In 1795 he sat again in the house of delegates. He had been elected "not only without his approbation, but against his known wishes." The great topic of public discussion at the period was the treaty with Great Britain, negotiated by Mr. Jay in 1794. The senate advised its ratification, but vehement efforts were made by the state rights party throughout the country to induce the president to withhold his approval. Popular meetings were held in every part of Virginia, and in the legislature, as well as elsewhere, the most violent debates took place. The land rang with angry discussion, and the republicans denounced the treaty as the sum of all evil. A meeting in Richmond characterized it as insulting, injurious, dangerous, and unconstitutional; and the hot blood of the speakers scarcely permitted them to respect the great name of Washington. It was at this moment that Marshall appeared as the champion of the treaty and the administration. Before an assembly of the same citizens who had denounced the proposed measure, he defended the treaty with such power of reasoning, that they reversed their former action, and adopted resolutions in favor of the federal policy by a considerable majority. The

contest in the legislature followed. The opponents of the administration introduced condemnatory resolutions, and triumphantly demanded what power the executive possessed to conclude a commercial treaty. Marshall took part in the debate upon the resolutions, and delivered a speech which is represented to have been one of the greatest and noblest of his performances. "His vast powers of reasoning," says Judge Story, "were displayed with the most gratifying success. He demonstrated not only from the words of the constitution, but from the universal practice of nations, that a commercial treaty was within the scope of the constitutional powers of the executive; and that this opinion had been maintained and sanctioned by Mr. Jefferson, by the Virginia delegation in congress, and by the leading members of the convention on both sides." The result of the speech was encouraging to the friends of the administration. The constitutional ground of objection was abandoned; and the assembly confined itself simply to an expression of its disapprobation of the treaty on the ground of its inexpediency at the time. This drawn battle, as it may be styled, in the heart and centre of the enemy's country, and with all the republican force arrayed against the advocate of the administration, greatly extended and increased the honorable renown of Marshall. Washington offered him the place of attorney-general of the United States, but this he declined, as interfering with a practice at the bar which had now become very lucrative. He continued in the legislature, which did not conflict with his professional engagements, and remained a staunch advocate of the policy of Washington, which he persistently defended against the strictures of the republican members. In the same year, 1796, he was offered the appointment of minister to France, to succeed Mr. Monroe, but declined it for the same reasons which had impelled him to refuse the attorney-generalship. Gen. Pinckney was appointed in his place, but the French directory refused to receive him; and in 1797 President Adams, who had succeeded Washington, sent a new commission to Marshall, who yielded his objections, and with Pinckney and Gerry proceeded as envoy extraordinary to Paris, to negotiate with the directory in relation to the obstructions thrown in the way of the commerce of the United States. These negotiations failed; but the correspondence between Marshall and Talleyrand proved highly honorable to the powers of the former, and greatly added to his reputation in America. The envoys returned in June, 1798, and were received with unmistakable evidences of popular approval and applause. On his arrival at New York, Marshall found himself the centre of all eyes, and his entrance into the city was a species of triumph. He was honored with a military escort, and crowds of the citizens thronged his lodgings, to testify their gratitude and respect. Public addresses were offered him, and a public dinner by members of both

houses of congress, "as an evidence of affection for his person, and of their grateful approbation of the patriotic firmness with which he had sustained the dignity of his country during his important mission." Marshall had faithfully reflected the views of the administration and the federal party of the country generally, in his official acts; and he approved of the series of measures directed against France, and so violently opposed by the republicans. The alien and sedition laws do not seem, however, to have received his approval; and during his subsequent career in congress he voted for the repeal of the most obnoxious section of the latter. He returned to the law, but was soon again urged to appear in defence of his party. Washington sent for him to visit him at Mount Vernon, and he finally yielded to the solicitations of his old commander, and consented to run for congress. He did so, and was elected in 1799 by a small majority. During the canvass, Adams offered him a seat on the bench of the U. S. supreme court, but he declined it. In congress he became the main stay and reliance of the administration. It was a period of bitter political animosity, and passionate conflict between the two great parties of the country. Virginia had recorded her solemn protest, in the resolutions passed by her assembly in the winter of 1798, against the alien and sedition laws, and had established arsenals and armories to defend her rights by force if necessary. Washington, the great bulwark of the federal party, was no longer at the head of the government; and the forces of the republicans, flushed with the daily increasing revulsion against the federal administration, began to charge the dispirited squadrons of their enemies, and put them to rout. It was at this crisis of affairs that Marshall appeared in congress as the federal leader, against the growing influence of the republicans. In the debates upon great constitutional questions, "he was confessedly the first man in the house," says Mr. Binney. "When he discussed them, he exhausted them; nothing more remained to be said; and the impression of his argument effaced that of every one else." The great event of Marshall's career in congress was the speech which he made in defence of the administration, in the affair of Jonathan Robbins. This person had committed a murder on board a British frigate, and fled to the United States. On the requisition of the British minister, who alleged that Robbins was a subject of Great Britain, he was surrendered by President Adams, in compliance with the clause in relation to such cases contained in Jay's treaty. The opposition in congress seized upon this act of the president, and furiously assailed him. All the old bitterness against the treaty seemed to have merely been pent up; it now rushed forth with clamorous violence. Mr. Livingston introduced a resolution of censure on the president for the surrender of Robbins at the dictation of the British minister, and upon this resolution took place an animated debate. The speech which he made on

this occasion is the only one which Marshall ever revised, and is that by which he is best known to the world. It was unquestionably one of the best evidences which he ever exhibited of that massive strength of reasoning which he possessed perhaps in greater degree than any other personage of the epoch. A competent authority has said of the speech: "It has all the merits and nearly all the weight of a judicial sentence. It is throughout inspired by the purest reason and the most copious and accurate learning. It separates the executive from the judicial power by a line so distinct, and a discrimination so wise, that all can perceive and approve it. It demonstrated that the surrender was an act of political power which belonged to the executive; and by excluding all such power from the grant of the constitution to the judiciary, it prepared a pillow of repose for that department, where the success of the opposite argument would have planted thorns." Judge Story says of the speech that "it was *réponses sans réplique*—an answer so irresistible that it admitted of no reply. It silenced opposition, and settled then and for ever the points of national law upon which the controversy hinged." In May, 1800, Marshall was appointed secretary of war, but before his entry on the duties of the office was offered the place of secretary of state, which he accepted. In this capacity he conducted several important discussions with the British minister, and drew up the instructions to Mr. King, the American minister to London, which hold a prominent place among the great state papers of the country.—On Jan. 31, 1801, he was appointed by President Adams chief justice of the U. S. supreme court. This, like almost every public appointment which he received throughout life, came to him unasked. He had even recommended another for the place of chief justice, but Adams disregarded his advice. The senate unanimously confirmed the appointment; and thus commenced that long career of sober usefulness and unostentatious devotion to the public good which has made the name of John Marshall so widely honored and beloved. He continued to act in the capacity of chief justice from this time to the period of his death. Of the eminent talents which he brought to the performance of his judicial functions, there can be but one opinion; and in the great tribunal of ultimate resort over which he presided, his influence is known to have been paramount. Of its adjudications a distinguished jurist has said: "The decisions of the supreme court of the United States have raised the renown of the country, not less than they have confirmed the constitution. In all parts of the world its judgments are spoken of with respect. Its adjudications of prize law are a code for all future time. Upon commercial law it has brought us nearly to one system, befitting the probity and interests of a great commercial nation. Over its whole path learning and intelligence and integrity have shed their combined lustre." In 1805 Judge Marshall published in 5

vols. a "Life of Washington," largely based upon unpublished official documents, in which he defended the course of Washington's administration against the assaults which had been made upon it by the republican party, with judicial moderation and dignity, but masterly effect. The first volume was separately published in 1824, as "A History of the American Colonies;" and in 1832 the whole work was revised and compressed into 2 volumes. The "Life of Washington" remains the most dignified, imposing, and trustworthy record of the events attending the establishment of the government. In 1828 Judge Marshall was a delegate from the city of Richmond to a convention held in Charlottesville, for devising a system of internal improvements, to be recommended to the legislature, and took part in the debates of the body. In 1829 he represented Richmond in the reform convention of that year to revise the old constitution of the commonwealth. He was now long past his prime, and his voice had become very feeble; but he exerted himself in debating the provisions of the new state constitution, as he had done in the old struggle to define the powers of the constitution of the United States. The basis of representation and the structure of the judiciary were the subjects upon which he chiefly dwelt. The debates of the convention were animated, and at times stormy. The east and the west contended vehemently for their opposing systems on the basis question; and the body threatened to separate in confusion. At last a compromise was agreed to, and upon this compromise Marshall made one of his most effective speeches. He said that he "hailed that auspicious appearance with all the joy with which an inhabitant of the polar regions hails the reappearance of the sun after his long absence of six tedious months." Of this speech John Randolph said: "The argument of the chief justice is unshaken and unanswerable. It is as strong as the fortress of Gibraltar." Its reasoning, he added, had been as little affected by the assaults upon it, as Gibraltar would be injured "by battering it with a pocket pistol." Judge Marshall's influence in the convention was very great, and the peaceful solution of the exciting questions which arose between the two sections of the commonwealth, was in a great measure due to his appeals in favor of moderation and mutual conciliation. The compromise scheme was adopted, and the convention adjourned. For many years Judge Marshall had been suffering greatly from a disease of the bladder. A surgical operation procured him relief, but a hurt received in travelling brought on an attack of liver complaint. He repaired to Philadelphia for medical assistance; but the disease overpowered him, and he died there in the 80th year of his age.—It remains for us to speak of Judge Marshall personally and in his capacity of private citizen. As such he was greatly revered and beloved. In person he was ungraceful. Mr. Wirt describes him as "tall, meagre, emaciated; his muscles

relaxed, and his joints so loosely connected as not only to disqualify him apparently for any vigorous exertion of body, but to destroy every thing like harmony in his air or movements. Indeed, in his whole appearance and demeanor—dress, attitudes, gesture, sitting, standing, or walking—he is as far removed from the idolized graces of Lord Chesterfield as any other gentleman on earth." In spite, however, of this ungainly person, no one was a greater social favorite than the chief justice. The people of Richmond regarded his eccentric figure with strong personal affection as well as respect. The black eyes, under their bushy gray brows, beamed with good nature, and the lips were habitually smiling. The courtesy of the judge was one of his most beautiful traits. It was the spontaneous exhibition of the simple and kindly emotions of his heart. Pure benevolence and philanthropy displayed itself in every word which he uttered. He gave his hand to the plain yeoman clad in homespun, as courteously and sincerely as to the greatest personage in the country. He had the same simple smile and good-humored jest for both, and seemed to recognize no difference between them. It was instructive to estimate, in the good chief justice, the basis and character of true politeness. John Randolph, one of the most fastidious and aristocratic of men, left his opinion that Marshall's manner was perfect good breeding. In dress and bearing it would be difficult to imagine any one more simple than Judge Marshall. He presented the appearance of a plain countryman rather than a chief justice of the United States. He had a farm in Fauquier co., and another near Richmond; and he would often return from the latter, to take his seat on the bench, with burrs sticking to his clothes. His great passion was the game of quoits; and he was a member of the club which met, as it still meets, at Buchanan's Spring, near the city, to play at this game. Here the governor of Virginia, the chief justice, and the most eminent lawyers of the court of appeals, were found by a French gentleman, Baron Quinet, with their coats off, gaily pitching quoits, with the ardor of a party of urchins. In these simple amusements passed the hours of leisure which Judge Marshall could steal from his exhausting judicial toil. At such times he seemed to become a boy again, and to forget the ermine. His fondness for other social enjoyments was great. He was the centre of a brilliant circle of men, who were many of them famous; and the tradition of their dinner parties, and the jests which circulated, is still preserved. The judge always provided for his dinner by proceeding to market in person; and on one of these occasions he carried home a turkey for a fashionable young gentleman, who took him for a simple countryman, and offered him a shilling for his trouble. The shilling was courteously refused by the chief justice, who calmly proceeded on his way, without revealing his name. The quality which made him the centre and chief object of attention in the

famous circle of which we have spoken, was not his wit or brilliancy in conversation. It was rather the simple and genial humor of the man, springing from the goodness of his heart, and the unassuming kindness of his disposition. To this engaging character of mind was added a pure and childlike religious faith. The hard muscular intellect had not built up its strength upon the ruins of the heart. It is related of him that he once chanced to be present at a discussion between two or three young men, upon the evidences of the Christian religion. They indulged freely in sneers, and at the end of the argument turned indifferently to the chief justice, whom they took, from his poor and plain costume, for some ignorant rustic, and asked him jocularly what he thought of the matter. "If," said the narrator of the incident, "a streak of lightning had at that moment crossed the room, their amazement could not have been greater than it was at what followed. The most eloquent and unanswerable appeal was made for nearly an hour, by the old gentleman, that he ever heard or read. So perfect was his recollection, that every argument used by the opponents of the Christian religion was met in the order in which it was advanced. Hume's sophistry on the subject of miracles was, if possible, more perfectly answered than it had been done by Campbell. And in the whole lecture there was so much simplicity and energy, pathos and sublimity, that not another word was uttered. An attempt to describe it would be an attempt to paint the sunbeams." This deep-seated religious faith never wavered. Marshall continued to repeat night and morning, in his serene old age, the prayer which he had been taught in the nursery at his mother's knee; and at a period when scepticism was fashionable among cultivated men, he never uttered a word calculated to throw doubt upon the divine origin of Christianity. A lesson of the deepest reverence for every thing holy was, on the contrary, taught by his daily life, and he died as he had lived trusting in the atonement of Jesus.—In terminating this sketch of the chief justice, we should not omit to record his affectionate and beautiful devotion to his wife. During her long and painful illness, which continued for many years, Judge Marshall seemed to think of nothing but her comfort, and the means of preventing her from suffering. There was a touch of chivalry in this dedication of every faculty to the ease of the excellent lady; and those who witnessed his devotion still speak of it as one of the most remarkable and affecting indications of his tenderness and goodness of heart.

MARSHALL, WILLIAM CALDER, a Scottish sculptor, born in Edinburgh in 1818. He studied under Chantrey and Baily, subsequently passed some years in Italy, and in 1839 took up his residence in London. His most successful ideal works are the "Dancing Girl Reposing," and "Sabrina." For the new houses of parliament he has executed statues of Clarendon,

Somers, and Chancery, and for the city of Manchester a colossal figure in bronze of Sir Robert Peel, beside a statue of Campbell to be erected by public subscription. His statue of Jenner was erected in Trafalgar square in 1859. He has executed comparatively few portrait busts. Since 1852 he has been a royal academician.

MARSHMAN, JOSHUA, D.D., an English missionary, born in Westbury-Leigh, Wiltshire, in 1767, died in Serampore, India, Dec. 5, 1837. In 1799 he was sent out to Serampore by the Baptist missionary society. He applied himself to the study of Bengalee, Sanscrit, and Chinese, and in 1826 visited England for the purpose of arranging certain differences between the missionaries and the missionary society; but his efforts were not successful, and he returned to India in 1829. His principal works are: a Chinese translation of the book of Genesis, the four Gospels, and the Epistles of Paul to the Romans and Corinthians; a "Dissertation on the Characters and Sounds of the Chinese Language;" "The Works of Confucius, containing the Original Text with a Translation;" "Clavis Sinica: Elements of Chinese Grammar," &c.; and "A Defence of the Deity and Atonement of Jesus Christ" (London, 1822), consisting of letters originally published in the "Friend of India," in reply to a work of the rajah Rammohun Roy, in which, while exalting the precepts, he had discredited the miracles of Christ. He assisted Dr. Carey in preparing a Sanscrit grammar and a Bengalee and English dictionary, and published an abridgment of the latter.

MARSI. I. An ancient people of Italy, of Sabellian race. They dwelt in the central Apennines, their territory surrounding Lake Fucinus (now Lago di Celano), between the land of the Sabines and Latium. Their principal town was Marruvium or Maruvium (San Benedetto), on the E. bank of the lake. Their origin is ascribed by some legends to Marsyas of Phrygia, and by others to Marsus, son of the sorceress Circe; the latter derivation may be owing to the circumstance of their having been acquainted with the medicinal qualities of some plants growing among the mountains of their territory, which were used as remedies against the bites of snakes. The Marsi enjoyed a great reputation for bravery among the Romans, against whom they fought in alliance with their neighbors, the Peligni, Marrucini, and other Sabellian tribes, in the latter part of the 4th century B. C., finally concluding a peace in 304. Having been for about 200 years the staunch allies of the republic, they became the prime movers of the great war known as the social or Marsic, waged for the right of the Roman franchise, which, though often defeated, they finally conquered by perseverance. It was proverbial among the Romans that "no triumph can be obtained over the Marsi or without them." II. An ancient people of Germany, on the banks of the Ems, probably a tribe of the Oherusci, with whom they fought under Arminius.

MARSIGLI, LUIGI FERDINANDO, count, an Italian soldier and savant, born in Bologna, July 10, 1658, died there, Nov. 1, 1730. He studied mathematics and natural history under Borelli and Malpighi, travelled in Turkey, afterward served in the imperial army, was wounded and captured by the Turks in the battle of Raab (1688), and after having been ransomed by his family was employed as boundary commissioner between Turkey and Austria. In the war of the Spanish succession, being second in command of the garrison of Brisach (1708) when that place surrendered to the French without offering any resistance, he was tried by an Austrian court martial and deprived of his rank in the army, although he gave evidence of the propriety of his conduct; the commander, Count Arco, was beheaded. Devoting himself henceforward to scientific pursuits, Marsigli published in 1726 his great work, *Danubius Pannonico-Mysicus*, of which a French translation appeared in 1744. He wrote several other works, among which is the "Military State of Turkey" in French and Italian. He presented his scientific collection to Bologna, where it served as a nucleus for an institute of sciences and arts; and his printing press, with an assortment of types for Latin, Greek, Hebrew, and Arabic, to the Dominicans of that city, on condition that they should print the works of the institute at cost.

MARSTON, JOHN, an English poet and dramatist, born about 1570, died about 1684. According to Anthony Wood, he was educated at Corpus Christi college, Oxford, after leaving which he was entered of the Middle Temple, London, where he was chosen lecturer in 1593. He was on terms of intimacy with Ben Jonson, to whom he dedicated, in 1605, his tragi-comedy, "The Malcontent." This intimacy did not however continue, and in his introduction to his tragedy of "Sophonisba," he accuses Jonson of plagiarism of classic authors in his "Catiline" and "Sejanus." Associated with Jonson and Chapman in writing "Eastward Ho!" he was with them imprisoned for a short time by James I. on account of its reflections against the Scotch. Marston had little dramatic genius, but was remarkable for the spirit and pungency of his wit as a satirist. The most important of his works, beside those above named, are: "The Scourge of Villainy," "The Metamorphosis of Pigmalion's Image," "Antonio and Mellida," "Antonio's Revenge," "The Dutch Courtesan," and "Parasitaster." Of these, the first two are satirical poems, the 3d and 4th tragedies, and the rest comedies. Marston's works were first collected and edited with a memoir by J. O. Halliwell (8 vols., London, 1856).

MARSTON, WESTLAND, an English author, born in Boston, Lincolnshire, Jan. 30, 1819. He is the son of a dissenting minister, and received a legal education in the office of his uncle, a solicitor in London. Subsequently he relinquished the law for literature, and entered upon a successful career as a dramatic author. Among his best plays are the tragedies of "The Patri-

cian's Daughter," "The Heart and the World," "Strathmore," and "Philip of France," several of which possess poetic merits of a high order. He has also produced some comic dramas, and a volume entitled "Gerald, a Dramatic Poem, and other Pieces," beside occasional lyrics contributed to the periodicals. His latest publication is a novel entitled "A Lady in her Own Right" (8vo., London, 1860).

MARSTON MOOR, a large open plain about 8 m. distant from the city of York, England, where a decisive victory was gained by the parliamentary forces and the Scots, under Lord Fairfax and the earl of Leven, over the royalists commanded by Prince Rupert, July 2, 1644. The advance of the royalists toward York, which was invested by Fairfax, having compelled the latter to raise the siege, he retired to Marston Moor, where Rupert encountered him on the afternoon of July 2 with 25,000 men. The parliamentary army was of equal strength. The battle commenced with an ineffectual cannonade on both sides, after which a pause of two hours ensued, each army watching the other across a brook which separated them. At 7 o'clock in the evening the signal for close combat was given, and Rupert, who commanded the right wing of the royalists, falling with characteristic impetuosity upon the parliamentary left wing, routed it, and pursued the fugitives to the distance of several miles from the field. The parliamentary centre was in like manner driven back by the royalist infantry with great loss, and the fortune of the day seemed so desperate that the three parliamentary generals, Lord Fairfax and the earls of Manchester and Leven, fled in different directions. The imprudence of Rupert, however, on this as on subsequent occasions, ruined the cause in which he was embarked. That part of the parliamentary left consisting of Cromwell's brigade of ironsides and David Leslie's Scottish regiments, with some fugitives rallied by Sir Thomas Fairfax, taking advantage of the disordered condition of the cavaliers, who were scattered in pursuit or engaged in plundering the baggage of their enemies, charged them in a compact body with such vigor that in a few minutes the fortune of the day was changed. After a few brief shocks the royal army was driven from the field, and their artillery, consisting of 25 pieces, with upward of 100 colors and 1,500 prisoners, captured. The royalist loss in killed and wounded exceeded 2,000, and that of the parliamentary army was nearly as great. A few days afterward York surrendered to Fairfax, and the power of the parliament was permanently established in the north of England.

MARSUPIALS, an order of implacental mammals, all, with the exception of the American opossums, now confined to Australia and its archipelago. The name is derived from the presence of a more or less complete *marsupium* or abdominal pouch in the females for the protection of their immature young, supported by two supplementary bones attached to the an-

terior margin of the pelvis. The cerebral characters have been described under MAMMALIA, and the peculiarities of the marsupial lactation under KANGAROO. They have been divided into two sections, according to the character of their food, the phytophagous or plant-eating and the rapacious or carnivorous and insectivorous groups. The former are characterized by the small size or absence of canine teeth, the large incisors (never more than 2 in the lower jaw), and broad tubercular molars; they include the 3 families of *phascologyda* or wombats, *macropodida* or kangaroos, and *phalangistida* or phalangers and koala. The 2d group have small and numerous incisors, 8 to 10 in the upper and 6 to 8 in the lower jaw, canines large and in both jaws, and pointed molars; they include the 4 families of *peramelida* or bandicoots, *didelphida* or opossums, *myrmecobiida* or Australian ant-eaters, and *dasyurida* or dasyures, the last the most carnivorous of all in habits and form. This order presents animals showing types of many of the placental orders; for instance, the phalangers call to mind the *quadrumana*, the dasyures the *carnivora*, the phascogales the *insectivora*, and the kangaroos the *edentata*. Australia is the great head-quarters of the marsupials, though they are found in its vicinity, and in America from the middle United States to Buenos Ayres, as well as on the W. coast of South America; those species in Australia nearly allied and with similar habits do not appear to be associated together in the same limited district. The connection between Australia and these animals seems to be in the dry nature of the country; a mother under ordinary circumstances could not leave her young to go in quest of water for 100 miles or more, without danger of finding them starved or destroyed on her return; the marsupial obviates the difficulty by taking her young along with her in the pouch.—The skull in marsupials presents the reptilian character of permanent separation of the bones, even in old animals; the palate is very imperfect, and the angle of the jaw bent inward; the number of teeth is greater than in placental mammals, and that of the incisors is never the same in each jaw; clavicles are present in most of the species; the marsupial bones, existing in both sexes, are considered by Owen as trochlear or sesamoid bones, developed in the tendon of the external oblique muscle of the abdomen as the knee-pan is in the tendon of the *rectus* of the thigh, the cremaster muscle winding around them in the male and the compressors of the mammary gland in the female; in many genera, like the opossums, the tibia and fibula are so loosely connected with each other and with the tarsus that the foot has a movement of rotation upon the leg, the inner toe acting as an opposable thumb. The brain is, relatively to the body, smaller in marsupials than in any other mammals, varying between 1 to 520 and 1 to 800; its structure is more simple, and its surface without convolutions or *corpus callosum*, and the intelli-

gence corresponds to this inferiority of cerebral development. The organs of smell, hearing, and other senses are well developed; the eyes are generally large and prominent, as most of them are nocturnal in their habits. There are 8 modifications of the stomach, it being simple as in the opossums and phalangers, with a glandular apparatus as in the koala and wombat, or sacculated as in the kangaroos (in the latter resembling in structure the human colon); these modifications do not appear to be related to the character of the food; in the genera with a simple stomach the cæcum is much developed, being sometimes 3 or 4 times as long as the animal, while it is very small in those with sacculated complex stomachs, showing the vicarious functions of these two portions of the alimentary canal; in the flesh-eating marsupials the intestine is suspended on a simple and continuous mesentery, as in carnivorous reptiles. The liver is divided into many lobes, and is always provided with a gall bladder; the pancreas and spleen are triangular or T-shaped; in the heart there is not the usual trace of the fetal communication between the auricles, on account of the early period at which the incompletely developed young begin to respire air. The lungs are constructed on the usual mammalian type, the only tendency to the oviparous structure being the entireness of the rings of the trachea in some of the phalangers; the kidneys present nothing unusual; the membranous portion of the urethra is longer and wider than in other mammals; the *vesicula seminales* are absent, and the glands sometimes double, with a corresponding duplication in the female organs; in these ovo-viviparous or implantal mammals the vascular layer of the allantois is not developed so as to organize the villi of the chorion or to form cotyledons or a placenta. For details on the anatomy, mode of development, and natural history of marsupials, the reader is referred to the article "Marsupialia," by Owen, in vol. iii. of the "Cyclopædia of Anatomy and Physiology," and to vol. i. of the "Natural History of Mammalia," by G. R. Waterhouse (London, 1846). Prof. Owen regards the koala as the most typical of the marsupials, having the greatest number of the modifications peculiar to the order, and the smallest number of those common to other groups of mammals. His classification of the order is into: 1, *sarcophaga* (flesh eaters), like *dasyurus*; 2, *entomophaga* (insect eaters), like the opossums; 3, *carpophaga* (fruit eaters), like the phalangers; 4, *poëphaga* (plant eaters), like the kangaroos; and 5, *rhizophaga* (root eaters), like the wombat.—The first traces of mammals on the globe are the fossil remains of marsupials in the Stonesfield oolite and the gypsum (eocene) of Paris, so that at those epochs Europe was inhabited by animals of a type now confined to Australia and America; similar fossils have been found in the caverns of Wellington valley, New South Wales, and in the calcareous caverns of Brazil by Dr. Lund, very nearly allied to species now living in those coun-

tries. The present occurrence of marsupials only in N. and S. America and in far distant New Holland, in connection with their fossil remains in both regions, has been used as an argument in favor of distinct local foci of creation, and against any unique centre of origin of existing mammals; the force of the argument, however, is weakened by the fact of the existence of marsupials in Europe (and perhaps in other countries) in former geological epochs.

MARSYAS, in Greek mythology, according to different traditions, a satyr or a peasant of Phrygia, son of Hyagnis, Cægrus, or Olympus. A flute, which Minerva had thrown away in disgust at seeing the distortion of her features, as she played it, reflected in the water, was picked up by Marsyas. The breath of the goddess, having once filled it, caused it still to emit the most beautiful strains whenever he blew through it. He therefore ventured to challenge Apollo to a musical contest, and played the flute as Apollo played the lyre. The latter triumphed only by adding his voice to the music of his instrument. The condition was that the victor should do what he pleased with the vanquished, and Marsyas was bound to a tree and flayed alive. His blood was the source of the river in Phrygia, an affluent of the Mæander, which bore his name; and his flute, being borne down this river, was thrown on shore near Sicyon, and was there dedicated to Apollo in his temple. The legend is supposed to have reference to the contest between the citharædic and aulædic styles of music.

MARTEL, CHARLES. See **CHARLES MARTEL**.

MARTEN, a carnivorous animal of the weasel family, and genus *mustela* (Linn.), which includes also the fisher and the sable of Europe. The pine marten or American sable (*M. Americana*, Turton) is smaller than the fisher, being about 17 inches from the tip of the nose to the base of the tail, the latter being 10 inches to the end of the hairs; it is also less common and considerably more valuable. The general color is a rusty yellow, with a lighter head, almost whitish throat, and dark tints on the back, varying according to season, latitude, and locality; the tail is cylindrical, bushy, and comparatively short; the inner fur is ash-colored at the base, yellowish brown near the end, and in the best specimens tipped with dark brown or black; it is coarse and light-colored in the summer season and in low latitudes, but in the Hudson's bay and Lake Superior districts the winter fur is fine, long, lustrous, and darker, the tail generally the darkest. It is a shy, cunning, and very active animal, rarely approaching the haunts of man, preferring the dense pine woods of northern latitudes; it is carnivorous, pursuing its prey into trees. It is generally taken in winter in dead-falls, set about $\frac{1}{2}$ of a mile apart, and baited with a piece of meat or fish; the winter traveller in the mining region of Lake Superior, in following the Indian trails and even the mail routes, sees many of these traps containing the dead and frozen victims, and is not

unfrequently surprised at finding the mail carrier stop to clear and reset his traps, regardless of the additional day required for the transmission of the important mail matter. This marten is properly called the American sable, though the mink, an animal of inferior value (of the genus *putorius*, Ouv.), is by furriers erroneously called by this name; it is worth from \$2 to \$4 a skin, according to quality and color; it is sometimes dyed and sold as Russian sable, when of very fine quality. It has been questioned whether the pine marten of Europe (*M. martes*, Linn.) is the same as the American; it is probably a distinct species, and is so regarded by Prof. Baird. The northern limit in America, according to Richardson, is 65° N., where trees cease; the absence of trees, and consequently of the marten, according to Pennant, for 25 degrees of longitude on the Asiatic side of Behring's straits, is in favor of the non-identity of the two species; the same facts would add to the improbability of the true sable (*M. erbellina*, Linn.) being found in this country; the southern limit, according to Audubon and Bachman, is about 40°, and its range extends from the Atlantic to the Pacific. The European pine marten is grayish brown, with a yellow spot under the neck. The beech marten (*M. foina*, Linn.) has a white spot on the throat, the body more reddish and yellowish brown, the tail brownish black, and the downy fur of all parts of a lighter hue. The sable will be described under its proper title. The martens have one more carnivorous tooth than the polecats, and are less sanguinary in their habits, eating when pressed more vegetable food; they are generally wild, inhabitants of woods, climbing trees in pursuit of birds, squirrels, and other small animals; they are all more or less nocturnal, preferring cold and uninhabited regions; all are more or less valuable for their fur, that of the sable being most prized, next that of the pine marten of America, then of the common and beech martens of Europe, and last and least of the American fisher.

MARTENS, GEORG FRIEDRICH VON, a German diplomatist and publicist, born in Hamburg, Feb. 22, 1756, died in Frankfort-on-the-Main, Feb. 21, 1821. He became in 1784 professor of jurisprudence at Göttingen; was ennobled in 1789, and was employed in various public capacities, serving during the 5 years previous to his death as Hanoverian ambassador at the German diet. His reputation rests on his *Précis du droit des gens modernes de l'Europe*, and his *Recueil de traités*, the latter of which, with continuations by other writers, includes treaties of 93 years, from 1761 to 1854. He also wrote *Cours diplomatique, ou tableau des relations extérieures des puissances de l'Europe*, and several other kindred works.—His nephew, KARL VON MARTENS, has published *Causes célèbres du droit des gens; Nouvelles causes célèbres; Recueil manuel et pratique des traités*, &c.

MARTHA'S VINEYARD, an island lying

off the S. coast of Massachusetts, and forming the principal portion of Dukes co.; pop. 4,401. The Vineyard sound separates it from the mainland. It contains 3 towns, Edgartown, Chilmark, and Tisbury. Edgartown is 14 m. S. E. from Wood's Hole on Cape Cod, 25 m. W. S. W. from Nantucket, 80 m. S. E. by E. from New Bedford, and 85 m. S. S. E. from Boston. The island is 21 m. long and 6 m. in average breadth. It has considerable woodland. The surface is generally level, though there are elevations rising to the height of 150 feet above the sea. There are some manufactures, but the fisheries and shipping furnish to the people their chief employment. Martha's Vineyard was discovered by Bartholomew Gosnold in 1602, though he gave the name, not to the island which now bears it, but to a neighboring islet which is now called No Man's Land. In 1642 Martha's Vineyard was settled by Thomas Mayhew, who had been a merchant at Southampton, England. In 1644 it was placed under the jurisdiction of Massachusetts, and in 1664 it was transferred to New York, but was restored to Massachusetts in 1692. It suffered much during the revolutionary war from the British, who plundered it of 2,000 head of cattle.

MARTIAL (MARCUS VALERIUS MARTIALIS), a Latin epigrammatic poet, born in Bilbilis, Spain, March 1, A. D. 48, died near the same place in or after 104. Little is known of his history except from his works, the younger Pliny being the only contemporary author who mentions him. He went to Rome in 66, resided there 35 years, and then returned to Bilbilis, where he lived at least 8 years. While in Rome the fame of his epigrams caused them to be sought not only in the capital, but also in Gaul, Germany, and Britain; he enjoyed the patronage and favor of the emperors Titus and Domitian; was raised to the rank of tribune and of knight; and possessed a mansion in the city, and a villa near Nomentum. His extant works consist of more than 1,500 short poems, in 14 books, bearing the general title of *Epigrammata*. The last two books, consisting of 850 disticha, are named respectively *Xenia* and *Apophoreta*. Still another book, containing 88 epigrams on the public shows, and bearing only in late MSS. the title of *De Spectaculis*, is attributed to him. The term epigram had previously been applied to any brief metrical effusion of whatever character, on whatever subject, and thus to the whole mass of the Greek anthology. Martial was the first to limit its meaning to a short poem, abounding in ingenious and pointed thoughts, all of which converge to a pithy and striking conclusion. He displays a singularly fertile fancy, a pungent wit, and refinement and delicacy of diction. No author has furnished a more full and minute delineation of Roman customs and social habits during the first century of the empire. But the adulation which he lavishes upon Domitian, and the obscenity in which he delights, prevent his character from commanding respect. The best editions are

those of Lemaire (8 vols., Paris, 1825) and Schneidewin (Grimma, 1842). Selections from his epigrams have been translated by various English poets. The only complete version is that by various authors in Bohn's "Classical Library" (London, 1860). Ramler translated Martial into German.

MARTIAL LAW is often confounded with military law; but these terms are by no means convertible. Military law, beside some customary law, consists chiefly of the articles of war; that is to say, of the code enacted by the supreme legislative authority, as in England by parliament and in the United States by congress, for the government of the army and navy. It embraces, also, the body of rules and regulations which are prescribed from time to time by competent military authority, for the preservation of the general discipline and order. Military law does not supersede the general municipal law. It is rather a branch of it, more limited, indeed, in the range of its application than the admiralty or the chancery law, for example, yet having a like authority with them. In this country, unlike some of the states of continental Europe, the application of military law to the soldier is not exclusive of, but coördinate with, the general civil law. Every soldier, as a citizen, is subject to the common law of the land; but as a soldier he is amenable to the military law. The special tribunals which administer this law are named courts martial, and hence, perhaps, has arisen in part the confusion of the military law with the law martial. (See COURT MARTIAL.) Martial law is, says Blackstone, in fact no law at all. Yet Stephen, an eminent commentator, defines the law as that, whatever it may be, which is imposed by the military power; and says that, if it exist at all now in the institutions of England, it is identical with the articles of war. So in his "Law Dictionary" Bouvier says martial law is a code established for the government of the army and navy. Its principal rules are to be found in the articles of war. Its object is to subject the whole military body to certain rules of discipline, essential to energetic and effective action, and violations of it are to be tried by courts martial. These authorities define very well military, and in a certain sense, but not well, martial law. A clearer idea is that furnished by an old writer, Smith, who in his "English Republic" says: "Martial law is the law of war, that depends on the just but arbitrary power and pleasure of the king. For, though he doth not make any laws but by common consent in parliament, yet in time of war, by reason of the necessity of it, to guard against dangers that often arise, he useth absolute power; so that his word is a law." However opposed to other authorities, this expresses what is distinctively meant both in England and in this country by martial law. When in time of extreme peril to the state, either from without or from within, the general safety cannot be trusted to the ordinary administration, or the

public welfare demands the adoption and execution of extraordinary measures, it may become necessary to declare the existence of martial law. This is, indeed, no law at all in its ordinary sense; it is in fact the abrogation of it. That which is done under martial law has not an immediate constitutional or legislative sanction, as the military or the statute law, for example, has. It proceeds directly from the military power, which has now become supreme. Yet remotely and indirectly martial law expresses the will of the people. The supreme court of the United States has held that a state legislature may proclaim its existence whenever the public safety demands it; and the constitution, by implication at least, also permits its proclamation by that clause which provides that the privileges of the writ of *habeas corpus* shall not be suspended, unless when, in cases of rebellion or invasion, it is essential to the general welfare. The right to judge whether the exigency has arisen belongs, it seems, exclusively to congress. So in England martial law and its incident, the suspension of the writ of *habeas corpus*, require the authority of parliamentary acts to give them a constitutional existence.

MARTIN, an American bird, the largest of the swallow family, belonging to the genus *progne* (Boie). The bill is strong and short, with a very wide gape and curved culmen; the wings lengthened, the 1st quill the longest; the tail moderate, but considerably forked; tarsi shorter than the middle toe and robust; the toes long and strong, the lateral ones equal, with curved claws. The best known is the purple martin (*P. purpurea*, Boie), generally distributed over North America; the length is $7\frac{1}{4}$ inches, the extent of wings 16, and the bill along the gape 1 inch; the general color is glossy steel blue, with purple and violet reflections; the female and young are less brilliant, and pale brownish below with darker and bluish blotches; the bill brownish black; the closed wings are rather longer than the tail, and the tarsi and toes are naked. Martins appear in Louisiana early in February in large flocks, in the middle states from the middle of March to the 10th of April, in New England about the 25th of April, and further north at a later period, departing for the south again about the 20th of August in immense flocks and all at once at the dawn of some calm morning. The flight is graceful, easy, and swift; they are expert in catching their insect prey, in bathing and drinking while on the wing, and in performing aerial evolutions to the annoyance of their bird enemies; they are very bold, and hesitate not to attack crows and hawks, which from their superior powers of flight they drive away; even the fierce little king bird (sometimes called field martin), with similar fighting propensities, has to yield to the strong and swift martin; they perch easily upon trees, and, notwithstanding the shortness of their legs, walk well upon the ground. From their attacking cats, dogs, and all flying marauders of the farm yard, they

are great favorites, and are provided with elevated boxes for rearing their young in most towns of the United States; these harbingers of spring are much attached to their breeding places, and return to the same year after year; in the absence of a box, they build in any crevice or hole in a tree; the mischievous boy, the industrious farmer, the Indian, and the slave, all respect the martin, and delight in his merry twitter. The nest is made of leaves, twigs, grasses, feathers, and other soft materials, and generally contains 4 to 6 pure white eggs; many pairs breed in the same box in perfect harmony; two broods are generally reared in a season; the males assist in incubation. The food consists of wasps, bees, beetles, and other insects, though they seldom seize the honey bee. In England some of the swallows are called martins; these, as the house martin (*cotyle urdica*, Boie), and the sand or bank martin (*C. riparia*, Boie), will be noticed under SWALLOW.

MARTIN. I. An E. co. of N. C., bounded N. by the Roanoke river; area, 420 sq. m.; pop. in 1850, 8,807, of whom 8,867 were slaves. The surface is level and the soil generally sandy. The productions in 1850 were 267,477 bushels of Indian corn, 2,860 of wheat, and 89 bales of cotton. There were 12 grist mills, 2 saw mills, 11 shingle mills, 10 churches, and 900 pupils attending public schools. Capital, Williamston. II. A S. W. co. of Ind., drained by the E. fork of White river and by Lick creek; area, 340 sq. m.; pop. in 1850, 5,941. The surface is hilly and the soil moderately fertile. The productions in 1850 were 8,428 bushels of wheat, 251,700 of Indian corn, 82,650 of oats, and 14,569 lbs. of wool. There were 6 churches, and 820 pupils attending public schools. The Ohio and Mississippi railroad intersects the county. Capital, Dover Hill.

MARTIN, ALEXANDER, an American soldier and statesman, born in New Jersey about 1740, died in Danbury, Rockingham co., N. C., in Nov. 1807. He was educated at the college of New Jersey, and after settling temporarily in Virginia, removed in 1772 to Guilford co., N. C. He soon after became a member of the colonial assembly, participated in the assemblies of the people which met in 1774-'5 to vindicate their rights, and in 1776 was appointed colonel of a regiment of the continental line, with which he fought at Brandywine and Germantown. At the conclusion of the war he reentered the general assembly of North Carolina, of which he became speaker. In 1782 he was elected governor of the state, and again in 1789, having in the interval been a member of the convention which framed the federal constitution; and from 1793 to 1799 he filled the office of U. S. senator from North Carolina. The degree of LL.D. was conferred upon him by the college of New Jersey, and at the time of his death he was a trustee of the university of North Carolina.

MARTIN, BENJAMIN, an English optician and author, born in Worplesdon, Surrey, in 1704,

died in London, Feb. 9, 1782. He commenced life as a ploughboy, and by a rigid course of self-education acquired a considerable knowledge of mathematics and of various branches of physical science. In 1785 he settled at Chichester as a schoolmaster, and lectured on mathematics, and subsequently removed to London, where for many years he carried on an extensive trade as an optician and maker of globes. In the latter part of his life he became involved in pecuniary difficulties through the misconduct of his son, and in a fit of mental alienation attempted to destroy himself. The wound inflicted on this occasion, though not immediately mortal, hastened his death. Among his numerous publications are a "Philosophical Grammar," "Description and Use of both the Globes, the Armillary Sphere, and Orrery," "Elements of Geometry," "Panegyric of the Newtonian Philosophy," "New Elements of Optics," "Mathematical Institutions," "Natural History of England," "The Philosophical Magazine," which was continued to the 14th volume, &c.

MARTIN, BON LOUIS HENRI, a French historian, born in St. Quentin, Feb. 20, 1810. He was educated at the college of St. Quentin, and in 1830 commenced his literary career by the publication of *Wolfthurm*, a romance, written in conjunction with his friend Félix Davin. It was followed by a series of historical novels illustrating the period of the Fronde, and in 1833 Martin undertook, in conjunction with several coadjutors, a "History of France by Leading Historians," a work intended to embrace within its scope extracts, chronologically arranged, from the principal chroniclers and historians. One by one the contributors dropped off, until Martin was left to conduct the publication alone. Tiring of this occupation, he determined to substitute for the work an original history, of which the first edition, under the title of *Histoire de France*, appeared in 1833-'6 (15 vols. 8vo.). The subject thenceforth became the engrossing labor of his life. Scarcely was the last volume of this edition issued from the press when he commenced a revision of the whole work on a more comprehensive plan, which occupied him 17 years, during which a 2d edition of the original work was also published. Of the 19 volumes of the second work, which appeared at irregular intervals, several have been honored with peculiar distinctions, the 10th and 11th, devoted to "Religious Wars," having received the first Gobert prize of the academy of inscriptions, and the 14th, 15th, and 16th, relating to the reign of Louis XIV., the second Gobert prize from the French academy, and after the death of Thierry, the first. Since the completion of the second revision Martin has published a third and more elaborate one, embracing the most recent discoveries in Celtic antiquities, and in ancient and mediæval history, religion, language, and literature (16 vols., 1855-'60). For a short period in 1848 M. Martin occupied the chair of modern history at the Sorbonne, and at various times he has contributed

historical and political articles to the leading periodicals of Paris.

MARTIN, DAVIN, a French Protestant divine, born in Revel in 1689, died in Utrecht, Holland, in 1721. He was admitted to the ministry in 1688, emigrated to Holland after the revocation of the edict of Nantes, and about 1686 became pastor and professor of theology and philosophy in Utrecht, where he passed the remainder of his life. He was an eminent biblical scholar, and published a celebrated "History of the Old and New Testament" (2 vols. fol., Amsterdam, 1707), embellished with 420 fine engravings, and known as "Mortier's Bible," editions of the Bible with notes, a treatise on revealed religion, and many minor works.

MARTIN, FRANÇOIS XAVIER, an American jurist and author, born in Marseilles, France, March, 17, 1764, died in New Orleans, La., Dec. 11, 1846. At the age of 18 he emigrated to Martinique, where he engaged in business. Various mishaps attended his efforts, and about 1786 he found himself in Newbern, N. C., whither he had gone to look after a cargo of molasses, friendless and penniless. Unwilling to return to France under these circumstances, he took up his residence in Newbern, and supported himself by teaching French. He also learned printing and established a newspaper, the copies of which he peddled through the adjoining counties; and subsequently he published school books, almanacs, translations of French works, &c. A year or two after his arrival in North Carolina he commenced the study of the law, and about 1789 was admitted to the bar, of which he soon became a leading member. At the same time he pursued his avocation of printer, and in the intervals of his practice prepared and published brief treatises on the duties of sheriffs, of justices of the peace, and of executors and administrators. At a later period, at the suggestion of the legislature, he prepared a compilation of the British statutes in force in North Carolina, at the period of the revolution, together with a digest of the statute laws of the state, and a translation of "Pothier on Obligations," which, published in 1802, was rendered directly from the French into English type in the composing stick. His researches into the statute law also suggested to him the idea of collecting materials for a history of North Carolina, which was published, chiefly in the form of annals, in 1829 (2 vols. 8vo., New Orleans). He also prepared a series of reports of the decisions of the higher courts of the state, now the oldest volumes of that character received as authority in the courts of North Carolina. After 20 years' practice in North Carolina, he was appointed by President Madison, soon after his accession to office, one of the judges of the territory of Mississippi, which position he filled for a year, when he was transferred to the bench of the territory of Orleans. The unsettled state of the law in the territory at that time, owing to the defective character of the civil code adopted in 1808, and to the

confusion resulting from engrafting certain principles of the common law upon the system of civil law then in vogue, rendered the office of judge one of peculiar difficulty. Judge Martin, however, by his incessant and well-directed labors in reconciling these discordant elements of law, acquired the title of the father of the jurisprudence of Louisiana. In Feb. 1813, soon after the formation of the territory of Orleans into the state of Louisiana, he was appointed its attorney-general; and in Jan. 1815, he was advanced to the bench of the supreme court, of which he remained a justice until near the close of his life, a period of 32 years. During nearly his whole judicial career he was troubled with defective eyesight, and for the last 10 years of his life was almost entirely blind. He nevertheless discharged his duties with perfect regularity and to the public satisfaction. He continued his occupation of reporter after his elevation to the bench, and published reports of the superior court of Orleans from 1809 to 1818 (2 vols.), and reports of the supreme court of Louisiana from 1818 to 1830 (18 vols.), beside a digest of the territorial and state laws in French and English (2 vols.), prepared under a resolution of the legislature. He also published a history of Louisiana, from its settlement to the treaty of Ghent in 1814 (3 vols. 8vo., 1827), which is of a character similar to his history of North Carolina. His will, written by himself on a half sheet of paper, and devising his large property to his brother, was unsuccessfully contested by the state on the ground that such an instrument could not be written by a blind man. As a jurist his reputation is widely extended in the United States, and he received the degree of LL.D. from Harvard college and Nashville university. In private life he was upright, amiable, and frugal.

MARTIN, JOHN, an English painter and engraver, born near Hexham, Northumberland, July 19, 1789, died in Douglas, Isle of Man, Feb. 9, 1854. Manifesting a taste for painting, he was apprenticed to a coach maker to learn herald painting, and subsequently to an Italian artist named Musso, with whom he removed in 1806 to London. He gave great attention to perspective and drawing, and for several years after his marriage, which took place in 1808, supported himself by painting on china and glass, and teaching. Resolving to bring himself into notice by some large work, he produced in 1812, after a month's labor, "Sadak in Search of the Waters of Oblivion," which found a place in the exhibition of the royal academy and a purchaser at 50 guineas. It was followed by the "Expulsion from Paradise" and by "Clitie" and "Joshua." The last two being hung in an ante-room at the academy exhibition, the artist was so displeased that he withdrew his name from the list of candidates for membership. His "Joshua" was soon after placed in a prominent position at the British institution, and received the prize of the year. During the next 10 years he appeared before the public in a series of works conceived in a peculiar style,

and among the most popular art productions of the day. Prominent among these were the "Fall of Babylon" (1819); "Macbeth" (1820); "Belshazzar's Feast" (1821), which obtained the premium of £200 from the British institution; the "Destruction of Heroulaneum" (1822); the "Seventh Plague" (1823); the "Creation" (1824); the "Deluge" (1826); and the "Fall of Nineveh" (1828). Mezzotint engravings of them, executed by the artist and disseminated by many thousands, added to their reputation, and have still a considerable degree of popularity. Martin subsequently relinquished painting for a number of years, devoting himself in the interval to designing and engraving a set of illustrations for Milton, for which he received 2,000 guineas, and to projects for improving the city of London, a subject on which he labored much during the last 20 years of his life. About 1838 he resumed his pencil, and worked industriously until a few weeks before his death. His last productions, 8 large pictures, intended to be his masterpieces, and entitled "The Last Judgment," "The Day of Wrath" and "The Plains of Heaven," were, though left unfinished, exhibited in the United States in 1856.

MARTIN, LOUIS AIMÉ. See AIMÉ-MARTIN.

MARTIN, MARGARET (MAXWELL), an American authoress, born in Dumfries, Scotland, in 1807. She came to America in 1815 with her parents, who settled in Fayetteville, N. C., but soon removed to Columbia, S. C., where she has since most of the time resided. For more than 17 years she taught a large female seminary in Columbia. In 1836 she married the Rev. William Martin, of the Methodist Episcopal church, and shared with him the life of an itinerant missionary. During her travels she employed herself in exploring and recording local traditions, and thus gathered materials for a large number of interesting and instructive papers which she communicated to the press. She has also written several volumes in prose and verse, chiefly of a devotional character. Among her publications are: "Day-Spring;" "Methodism, or Christianity in Earnest;" the "Sabbath-School Offering," a collection of poems and true stories; and two volumes of poetry, "Religious Poems" and "Flowers and Fruits." The Rev. Mr. Martin is now the president of the female college in Columbia, and she shares with him the labors of instruction.

MARTIN, SARAH, an English philanthropist, born at Caistor, near Yarmouth, in 1791, died in Yarmouth, Oct. 15, 1848. Her opportunities of early education were meagre, and at the age of 14 she learned the trade of dressmaking, which she followed for many years. She had taken an interest in the miserable condition of the inmates of the county gaol, and in 1818 this interest was quickened into active effort by the imprisonment of a woman for cruelty to her own child. An interview with the culprit demonstrated to her the necessity of prison visiting; and she repeated her visits, reading the Scriptures and good books to the prisoners, and

conversing with them kindly and familiarly. After a while she spent each Sunday morning with them, conducting a religious service there, as no one else would do so, and presently added an afternoon service also. She gave up, soon after, one day in the week to the prisoners, though she could ill afford it; and by the aid of friends procured for them more comfortable clothing, books for instruction and for a library, and materials for work. In 1826, on the death of a relative, she came into possession of an annual income of from \$50 to \$60, and thenceforth devoted herself entirely to her missionary work. She provided employment for prisoners after their discharge, where they could be under her supervision; instructed those still in prison in elementary studies for an hour or two each day; organized a large school in the work-house, which she managed with great skill and success; devoted two evenings in the week to a school for factory girls which she originated, and on the other evenings visited the sick and the poor. Without entering into, or perhaps understanding fully, the theories of prison reform, she had put in practice every one of those measures which the most eminent authorities now agree in considering desirable; and this without counsel from others, without superior education, and with limited means. Though plain in appearance, she possessed a power of controlling the most turbulent and vicious; and she records the fact in her journal, that she never found a prisoner obstinate in his opposition to her plans, or long indifferent to her wishes.

MARTIN, WILLIAM D., an American lawyer and politician, born in Martintown, Edgeworth district, S. C., Oct. 20, 1789, died in Charleston, Nov. 16, 1838. He completed his legal studies at Litchfield, Conn., where he accumulated 8 folio volumes of original notes upon the lectures. He practised his profession in Edgefield, Ocoawhatchie, and several other courts, and in 1816 was elected a representative in the legislature of South Carolina. In 1818 he was made chairman of the judiciary committee and clerk of the state senate, and in 1826 was elected a representative in congress. Reputed one of the ablest jurists and advocates of South Carolina, he became in 1830 a judge of the circuit court; and his judicial decisions added to his reputation for learning and ability. As a statesman he belonged to the ultra states' rights school, and was prominent in maintaining the principle of nullification. He was found dead in his bed at Jones's hotel, Charleston.

MARTINEAU, HARRIET, an English authoress, born in Norwich, June 12, 1802. She is descended from French ancestors, who left their country on the revocation of the edict of Nantes and established themselves at Norwich, where her father was a manufacturer of bombazines. In spite of rather straitened circumstances, Mr. Martineau gave his children a sound and liberal education; and at an early age Harriet, who had been afflicted from childhood with a constantly increasing deafness and a total lack of

the sense of smell, found her chief recreation in literary composition. Pecuniary disasters soon taught her to rely upon her pen for support. In 1823 she published "Devotional Exercises for the Use of the Young," and in 1824 a tale entitled "Christmas Day," a sequel to which, "The Friend," appeared in 1825. Encouraged by the success of these works, she produced in the following year "Principle and Practice," "The Rioters," and "Original Hymns;" and in 1827-'8 "The Turn-Out," "Mary Campbell," "My Servant Rachel," a "Sequel to Principle and Practice," and a series of "Tracts" on questions relating to the working classes, in whose welfare several of her previous writings had betrayed a strong interest. In 1831 she published, under the title of "Traditions of Palestine," a series of sketches of the Holy Land during the period of Christ's ministry. In the same year she obtained prizes from the British and foreign Unitarian society for 8 tracts on "The Faith as Unfolded by many Prophets," "Providence as Manifested through Israel," and "The Essential Faith of the Christian Church." About this time she conceived the plan of issuing a series of monthly stories illustrating the leading principles of political economy, an idea which she had borrowed from Mrs. Marcet's "Conversations" on the same subject. The society for the diffusion of useful knowledge, to which she at first applied, refused to enter into the project, and it was only after many rebuffs and disappointments that she succeeded in finding a publisher. The immediate and remarkable success, however, with which the first tale was received, repaid the authoress for her perseverance. The series extended to 24 stories, which were many times reprinted and translated into French and German, and which fixed her reputation as an earnest thinker and a writer of fiction of no common abilities. The "Illustrations of Taxation" and "Poor Laws and Paupers," which next appeared, were written with the same plan, and also published serially. In Aug. 1834, Miss Martineau sailed for America, and travelled extensively in the United States, where she was the object of many attentions. She visited nearly all portions of the country, and on her return in the summer of 1836 recorded her impressions of American life and institutions in a work entitled "Society in America" (1837), which provoked some unfavorable comment in the United States, but was generally praised for its honesty and candor. Having been solicited to communicate more of her personal narrative and incidents of travel than it suited her purpose to give in this work, she published in 1838 her "Retrospect of Western Travel." In the following year appeared "Deerbrook," her first and most popular novel; and about the same time she wrote "The Hour and the Man" (a work of fiction founded on the career of Toussaint l'Ouverture), and a series of tales for children entitled "The Playfellow," among which were "The Settlers at Home,"

"Feats on the Fiord," and "The Crofton Boys." Her health, which had been delicate from childhood, now became so seriously affected that from 1839 until 1843 she was obliged to desist from all literary occupation. In the latter year she published "Life in the Sick Room." In 1844, having lost all hope of a restoration to health by the ordinary methods, she resolved to try the agency of animal magnetism; and the result, as described by herself in the "Athenæum" literary journal, was a speedy restoration to perfect physical and mental health. The circumstance attracted much notice on both sides of the Atlantic, and Miss Martineau's narrative was reprinted in pamphlet form in New York. She at once resumed her literary activity, and published her "Forest and Game Law Tales," and "The Billow and the Rock." In 1846, in company with her friends Mr. and Mrs. Richard V. Yates, she undertook an oriental tour, of which an account appeared in 1848 in her "Eastern Life, Past and Present." Her next important publication was a continuation of the "History of England during the 80 Years' Peace, 1816-1846," begun by Mr. Charles Knight, but of which only the first book had appeared. The work was issued in 2 vols. 4to. in 1849 and 1850; and in 1851 Miss Martineau added to it an "Introduction" in 1 vol. In the same year she gave to the world her correspondence with Mr. H. G. Atkinson on "The Laws of Man's Nature and Development," which abounds in curious revelations of her own psychological experiences, and manifests a decided leaning toward the principles of Comte. Her philosophical views were still more plainly set forth in 1853 by a condensed version of Comte's "Positive Philosophy." Among Miss Martineau's other writings are: "Five Years of Youth," "How to Observe," a work for travellers, published in "Knight's Series," "The Maid-of-all-work," "The Housemaid," "The Lady's Maid," "The Dressmaker," "Household Education," originally contributed to "The People's Journal," a "Complete Guide to the Lakes" (1854); "The Factory Controversy" (1855); and "Local Dues on Shipping" (1856). Her last work is "England and her Soldiers" (1859). She is a frequent contributor to some of the leading magazines, "Once a Week," and other periodicals, and to the editorial columns of the London "Daily News." She takes a deep interest in all questions of reform, and has written much on slavery, toward which her works on America evince a strong hostility. Miss Martineau now resides in a cottage built by herself near Ambleside. She has twice refused on conscientious grounds the offer of a pension from government.

MARTINEAU, JAMES, brother of the preceding, an English Unitarian clergyman, born in Norwich about 1805. He studied at the Unitarian college in York, and was settled successively over chapels in Dublin and in Liverpool. In 1858 he was called to the chair of moral and metaphysical philosophy in Man-

chester New college, Gordon square, London, and in 1858 to the joint pastorate with the Rev. John James Tayler of the principal Unitarian chapel in Little Portland street. The British "Quarterly Review" speaks of him as the foremost representative at once of Unitarianism within the pale of the Unitarian church, and of several analogous modes of belief outside the pale of that body. A writer in the "Scotsman" says: "Every sermon he delivers is a carefully written and well digested essay, which it requires the closest attention thoroughly to appreciate and understand. Calm, grave, and ascetic-looking, past middle life, of a gray, bloodless complexion, his black hair is still profuse and unsilvered. . . . In one of his epigrammatic sentences, we heard him, in describing man as distinguished from the lower animals, say that man reasons about reason, and thinks about thought; a sentiment true of all, and *par excellence* of himself, than whom there are few more acute thinkers in England." Mr. Martineau, in conjunction with two clergymen of Liverpool, the Rev. Messrs. Thom and Henry Giles, was engaged in a discussion by alternate public lectures with 18 clergymen of the church of England, on the Trinity, total depravity, atonement, and kindred doctrines. These lectures were afterward collected and published in 2 volumes, entitled "Unitarianism Confuted," and "Unitarianism Defended." Mr. Martineau was the author of 5 lectures in the latter volume. His other works are: "The Rationale of Religious Inquiry" (12mo., London, 1839); "Endeavors after the Christian Life" (2 vols. 8vo., London, 1843); "Miscellanies," edited by the Rev. Thomas Starr King (Boston, 1852); "Studies of Christianity," edited by the Rev. William R. Alger, and published by the American Unitarian association (Boston, 1858); and many articles in the "Westminster," "National," and other English reviews and journals.

MARTINEZ DE LA ROSA, FRANCISCO, a Spanish statesman and poet, born in Granada, March 10, 1789. He took an active part in his country's war of independence, familiarized himself while in England with the working of constitutional forms of government, and was elected member of the cortes in 1813. After the return of Ferdinand in 1814 he was imprisoned, on account of his liberal opinions, in the fortress of Penon on the coast of Morocco, until 1820, when the revolution of that year restored him to liberty. He was appointed secretary of state, but the moderation of his views failed to give satisfaction to any of the extreme parties; and after the subversion of the constitution by French interference, he left Madrid and spent a number of years in Paris, engaged in literary pursuits. After the revolution of July, 1830, he was permitted to return to Spain; and being appointed prime minister by Maria Christina in March, 1834, he promulgated the famous *estatuto real*, or the new constitution, which virtually abrogated that of 1812. The revolt of the Basque provinces led him to with-

draw from the administration; the old constitution was restored, and in 1840 Maria Christina's government was overthrown, and Epartero came into power. Martinez de la Rosa retired to Paris, where he was for some time ambassador; and afterward (1842-'8) he resided in the same capacity in Rome. After the fall of Epartero he joined Narvaez's cabinet, and remained in office with him until 1846. From 1847 to 1851 he was again ambassador to Paris and Rome. Subsequently he returned to Madrid, where he was chosen to the presidency of the senate, which he still holds. In Oct. 1857, he joined the Armero-Mon administration; and by royal decree of July 14, 1858, he was appointed president of the council of state, which office he still retains. He officiates at the same time as president of the board of education, and as secretary of the academy. He is the author of several novels and lyrical poems, which latter are highly esteemed. The most popular of his many dramas is the "Conspiracy of Venice." He has written also a review of the era of the French revolution (*Espiritu del siglo*, 10 vols., Madrid, 1835-'41), which is modelled after the revolutionary history of M. Thiers. The best edition of his miscellaneous works is contained in Baudry's *Bibliothèque Espagnole* (6 vols., Paris, 1844-'6).

MARTINI, GIAMBATTISTA, an Italian composer and author, born in Bologna in 1706, died Aug. 3, 1784. He early entered the order of Franciscans, visited Asia, and on his return devoted himself to music, being appointed chapel-master to a Franciscan convent in Bologna, which situation he filled during the remainder of his life. He was an industrious composer of church music, and published two musical treatises, an "Essay on Counterpoint," and a "History of Music" (8 vols. 4to., 1757-'81). He collected a remarkable library of musical works, numbering 17,000 volumes.

MARTINIQUE, or MARTINICO, one of the French West India islands, belonging to the Windward group, lying between lat. $14^{\circ} 23' 43''$ and $14^{\circ} 52' 47''$ N., and long. $60^{\circ} 50'$ and $61^{\circ} 19'$ W., 80 m. S. E. from Dominica and 20 m. N. from St. Lucia; length 45 m., breadth from 10 to 15 m.; area, 880 sq. m.; pop. in 1851, 123,701; in 1858, 136,460. The island is irregular in form, high, rocky, and volcanic, containing 5 or 6 extinct craters, one of which is of enormous dimensions. In the interior are 8 mountains, the highest of which, Mont Pelée, in the N., 4,488 feet above the sea, after a long period of inaction, burst forth in a violent volcanic eruption in Aug. 1851. From these mountains several ranges of low volcanic hills extend to the sea, and between them lie broad, fertile valleys. The rivers are numerous, but all small; most of them in the rainy season become fierce torrents. The coasts are indented by many bays, which are difficult of access. The E. side of the island, called Cabes-Terre, is more broken and sterile than the W., called Basse-Terre. About one third of the surface is under cultivation, the principal productions being sugar,

coffee, cotton, cassia, manioc, bananas, indigo, maize, cacao, and ginger. The climate is humid, and the average annual fall of rain is 84 inches. The year is divided into two seasons, one commencing about Oct. 15 and lasting 9 months, and the other comprising the rest of the year. During the latter season the rains are abundant, and yellow fever and similar diseases prevail. The mean annual temperature of the plains is 81° F. The annual value of the agricultural produce is about \$2,500,000, and the number of cattle is 150,000. The manufactures of Martinique possess considerable importance; there are several establishments for the preparation of indigo, about 100 for the various processes in the preparation of sugar, coffee, cocoa, and cotton, 6 potteries, 65 lime kilns, and 55 steam mills. There is an active commerce, chiefly with France. The principal exports in 1857 were 57,838,880 lbs. of sugar, 125,435 of coffee, 299,902 of cocoa, 180,695 of cassia, 186,807 of logwood, 4,594 of cotton, and 1,190,370 galls. of rum. The value of exports in 1855 amounted to \$4,126,792, and that of imports to \$3,981,715; revenue, \$364,434; expenditure, \$363,484. In 1858 the aggregate value of the import and export trade of France with Martinique was \$8,000,000. The average in the 5 preceding years was \$7,000,000.—The government is exercised by a governor, a privy council of 7 members, and a colonial council of 80 members elected for 5 years. The judiciary consists of a supreme court, and 2 assize and 2 inferior courts. The capital is Fort Royal, but St. Pierre is the largest town and the chief seat of commerce.—Martinique, called by the Indians Madiana, was discovered by Columbus in 1493. The French colonized it in 1635, and during the war of American independence made it a great naval station. The British wrested it from them in 1794, and restored it in 1803; took it again in 1809, and surrendered it in 1815. In 1819 it was ceded to Sweden, but the transfer was never actually effected. Slavery was abolished in Martinique in 1848.

MARTIUS, KARL FRIEDRICH PHILIPP VON, a German naturalist and traveller, born in Erlangen in 1794. He was graduated as a physician at the university of his native town, and from 1817 to 1820 accompanied Spix to Brazil, as botanist of the expedition which had been despatched under the auspices of the Austrian and Bavarian governments for the scientific exploration of that country. The result of his observations is embodied in his *Reise nach Brasilien* (3 vols., Munich, 1824-'31), a work which, both on account of its literary merits and of its fulness of information on the ethnology, geography, statistics, and general natural history of Brazil, belongs to the first class of scientific works of travel. Spix furnished some materials for the preparation of the 1st volume. A series of his subsequent works is devoted exclusively to the botany of Brazil, the herbarium which he brought back to Germany including over 7,000 species of plants. He has

devoted 27 years to the study and collection of palms, and his *Genera et Species Palmarum* (8 vols., Munich, 1828-'45, with 219 illustrations) contains a comprehensive description of the whole family of palms, and is considered the most magnificent contribution to botanical literature of modern times. His *Flora Brasiliensis* has appeared in Stuttgart since 1829, and is continued under his direction, with the co-operation of several eminent botanists. Martius has officiated for several years past as professor and director of the botanic garden at Munich, and both as a writer and teacher he has contributed powerfully in promoting the knowledge of natural history, especially of that of South America.

MARTOS, IVAN PETROVITCH, a Russian sculptor, born in Itchnia about 1755, died April 17, 1835. He studied his art in Rome, where he was maintained at the expense of the empress Maria Fedorovna, and ultimately became director of the academy of fine arts in St. Petersburg, and the most eminent Russian sculptor of his time. Among his chief works are the colossal bronze statues of the patriots Minin and Pozharsky at Moscow, the monument to the emperor Alexander at Taganrog, and that of Potemkin at Cherson.

MARTYN, HENRY, an English missionary, born in Truro, Cornwall, in 1781, died in Tokat, Asia Minor, Oct. 16, 1812. He was educated at St. John's college, Cambridge, where he obtained a fellowship in 1802. About this period the sudden death of his father turned his thoughts to religion. He resolved to become a missionary, and in 1805 set sail for India under the auspices of the African and eastern missionary society. He travelled for several years in India and Persia, preaching the gospel, and studying the native languages with such success that he was chosen to superintend the translations of the New Testament undertaken by direction of the missionary society into Hindostanee and Persian; and he had made some progress in an Arabic version when his failing health compelled him to suspend his labors. He was on his way home when he was overtaken by his last sickness. There is a memoir of his life by the Rev. John Sargent (1819).

MARTYR (Gr. *μάρτυρ*, a witness), a term applied to all who endure punishments for the sake of religion, and in a more limited sense to those who suffer death to bear testimony to the truth of the gospel. During the persecutions of the Christians in the early centuries an immense number of martyrs suffered for the faith, though Gibbon endeavors to prove that there were not more than 2,000 throughout the Roman empire. Their "acts," that is, the narratives of their trials, sufferings, and death, were piously collected by the faithful, and in Rome there were even deacons appointed especially for this purpose. A great number of these acts are still extant, many of which are of undoubted authenticity. The modes of punishment often displayed the most ingenious cruelty.

Some of the victims were beheaded, others burned to death, others scalded, others flayed alive, others thrown to wild beasts, others scourged, others crucified. It is said that Nero used to cause Christians to be smeared with some combustible substance and placed blazing in the public streets to light the road. The following instances of individual martyrdom are also recorded. St. Sebastian was shot with arrows, and left for dead, but recovering from his wounds was beaten to death with clubs. St. Lawrence was broiled on a huge gridiron. Flavia Domitilla and her two female companions were shut up in a room which was then set on fire. St. Symphorosa, after having been hanged by the hair in the temple of Hercules and severely scourged, was thrown into the river; and her 7 sons, who had to witness her sufferings, were then tied to stakes and martyred in each other's sight. During a terrible persecution at Lyons under Marcus Aurelius, Sts. Maturus and Sanctus were roasted in a red-hot iron chair. St. Blandina at the same period was scourged, torn by beasts, partly roasted on the iron chair, put into a net and tossed by a wild bull, and finally despatched with the sword. St. Felicitas, a noble Roman lady, after witnessing the torture and death of her 7 sons, was beheaded. The remains of vast multitudes of the martyrs were deposited in the catacombs of Rome, which thus came to be regarded as a great storehouse of relics from which the Roman Catholic churches have ever since been chiefly supplied. The festivals of the martyrs are celebrated on the anniversaries of their death.—For the conditions requisite, according to Catholic theologians, to entitle one to the name of martyr, see Cardinal Lambertini (afterward Pope Benedict XIV.), *De Servorum Dei Beatificatione et Beatorum Canonisatione*. See also Ruinart, *Acta Sincera Martyrum*.

MARTYR, PETER, an Italian historian. See ANGHIERA.

MARTYR, PETER, a Protestant reformer. See VERMIGLI.

MARTYROLOGY. See ACTA SANCTORUM, and BOLLAND.

MARVELL, ANDREW, an English author and legislator, born at Winestead, in Holderness, Yorkshire, March 2, 1621, died in London, Aug. 17, 1678. He was the son of the Rev. Andrew Marvell, master of the grammar school and lecturer of Trinity church in Hull, and at the age of 15 was sent to Trinity college, Cambridge. In the early part of his academical career he was induced by some Jesuit priests to leave his college and go to London, where he was discovered by his father, who caused him to resume his studies at Cambridge. He is said to have taken his degree of B.A. in 1638, and subsequent to 1641 he passed 4 years on the continent, remaining a considerable time in Italy, where he probably contracted his intimacy with Milton, which was interrupted only by the death of the latter. Subsequently he acted as private tutor to various persons, and in 1657 was asso-

ciated with Milton in the Latin secretaryship. In 1660, or according to some accounts in 1658, he was returned to parliament as one of the members from Hull, a position which he filled by successive elections until the close of his life. He is said to have been the last member of parliament who received "wages" from his constituents. Between 1661 and 1663, for some unknown cause, he was absent in Holland, and from July in the latter year to 1665 he acted as secretary to Lord Carlisle, the ambassador extraordinary to Russia, Sweden, and Denmark. With the exception of these intervals of absence, he was the watchful and incorruptible guardian of the interests of his constituents, with whom he maintained a close correspondence, sending them during the greater part of his legislative career a daily account of the proceedings in parliament. These letters, first published in 1777, are written in a laconic, business-like style, and afford a curious illustration of the ability and fidelity with which Marvell performed his public duties. He appears never to have spoken in parliament, but his strong views of the corrupt practices of the time, his biting satires in prose and verse on influential placemen, and the conviction among his opponents that he was not to be silenced by bribes or flattery, made him a formidable enemy to the court. It is even said that on more than one occasion he was threatened with assassination. He however retained the regard of some influential men of the opposite party, among others of Prince Rupert; and a familiar anecdote is told of his having so greatly pleased Charles II. at a private interview by his wit and agreeable conversation, that the latter despatched the lord treasurer Danby to offer him £1,000, with a promise of a lucrative place at court, which Marvell refused, notwithstanding he was immediately afterward compelled to borrow a guinea of a friend. The story rests wholly on tradition, but serves to illustrate the popular opinion of Marvell's probity and honor, which, "amid corruption perfectly unparalleled," were so conspicuous as to have earned for him the name of the "British Aristides." He died suddenly, supposed by some to have been poisoned, for which there seems to be no reasonable ground, and was buried in the church of St. Giles-in-the-fields at the expense of his constituents, who also voted a monument to his memory, which the rector refused to have erected. His chief work in prose is the "Rehearsal Transposed," written in reply to an acrimonious attack by Dr. Samuel Parker, afterward bishop of Oxford, upon the non-conformists, and in which he exhibited his adversary in so ridiculous a light that even his own party could not help laughing at him. A rejoinder, supposed to be by Parker, elicited the second part of the "Rehearsal," one of the most remarkable passages of which is the author's generous defence of Milton from the aspersions of his enemies. The whole work, though dealing in humorous satire with a broadness and coarseness unknown to controversial writings

of the present day, contains, amid all its levities, "a vehemence of solemn reproof, and an eloquence of invective," says Disraeli, "that awes one with the spirit of a modern Junius." His last work, "An Account of the Growth of Popery and Arbitrary Government in England" (1678), was so distasteful to the court, that a reward was offered for the discovery of the printer, and Marvell was compelled frequently to conceal himself from fear of assassination. His poems comprise a number of political satires, written in a coarser strain than his prose works, and which Hallam characterizes as "gross and stupid," and some minor pieces of great tenderness and beauty, including the well known commendatory lines on Milton's "Paradise Lost." A complete edition of his works was published in 1777 (3 vols. 4to.) by Capt. Thompson, a native of Hull; and an American edition of his poems, edited by James Russell Lowell, appeared in 1857 (12mo., Boston).

MARX, ADOLPH BERNHARD, a German composer and writer on music, born in Halle, Nov. 27, 1799. He was instructed in jurisprudence and held a judicial office at Nuremberg, but subsequently devoted himself exclusively to the study of music. In 1828 he became editor of the *Berliner Allgemeine Musik-Zeitung*, and the successful manner in which he conducted it for 7 years procured him in 1880 the appointment of professor of music in the university of Berlin, a position which he still holds. His labors have extended over every part of the science of composition and the history and philosophy of music. His principal works are: "The Theory of Musical Composition" (Leipzig, 1887; 8d ed. 1892; English translation by Saroni, New York, 1892), and "General Theory of Music" (Leipzig, 1889; 4th ed. 1890); and he has also written treatises on the "Art of Singing" (1826), "Painting in Music" (1828), &c., beside many articles in Schilling's "Universal Lexicon of Music." He is known as a composer by several musical dramas, symphonies, &c., and by his oratorio "St. John the Baptist."

MARY, the mother of Jesus. But little is recorded of the history of Mary in the Scriptures. Luke gives her genealogy, in order to prove the truth of the predictions which had foretold the descent of the Messiah from Adam through Abraham and David. The next mention of her is as a young maiden at Nazareth, where she was betrothed to a carpenter named Joseph. A heavenly messenger announced to her that through the overshadowing of the Holy Spirit she should conceive a son, who should be called the Son of God, and who would be the Messiah expected by the Jews. Almost immediately on receiving this announcement Mary hastened from Nazareth to visit her cousin Elizabeth, who was residing in the hilly district in "a city of Judah." When there, she uttered the *Magnificat*, a hymn which the Christian church has delighted from the earliest times to use as an expression of thanksgiving. After a sojourn of three months, she returned to Naz-

areth, when Joseph suspected her of infidelity, and resolved, in order to avoid a public exposure, to dismiss her privately. But an angel (Matt. i. 18-25) informed him in a dream of the true state of the case, and enjoined him to take Mary as his wife. He complied with this order, and was therefore regarded by the Jews as the father of Jesus. Soon after, when Augustus ordered a census to be taken throughout the empire, Mary went with Joseph to be enrolled at Bethlehem, the city of David, and there gave birth to Jesus. According to the law of Moses, she offered him in the temple (Luke ii. 22 *et seq.*), and returned with Joseph and the child to Nazareth, whence the whole family had to flee to Egypt. After the death of Herod, they again took up their residence at Nazareth. When Jesus was 12 years old, Mary visited Jerusalem with him and Joseph at the time of the pass-over. On their return Jesus was missed from the company, and she discovered him sitting in the temple disputing with the doctors of the law. She was present at the marriage feast in Cana, in vain endeavored to induce Jesus to desist from preaching in the synagogue of Capernaum, followed him to Jerusalem, saw him crucified on Calvary, and was consigned by him to the care of the apostle John, who took her into his house. After the ascension of Christ she was present at the meetings of the apostles and disciples.—Mary is the object of a special veneration in the Roman Catholic church, which honors the saints with the worship known as *dulia*, a religious service rendered them on account of the supernatural gifts wherewith she holds that God has distinguished them, but decrees to the Virgin the ampler honors of *hyperdulia*, placing her high above all created objects of religious respect on account of her transcendent grace, merits, and glory. The council of Trent, treating upon original sin, decreed that “the blessed and immaculate Mary, the mother of God, is exempt from all sin, actual and original.” Pope Pius IX., in 1854, declared the immaculate conception of the Virgin Mary to be a doctrine of the Roman Catholic church. Controversies in reference to the proper position of Mary arose early in the history of the church. Those of the innovators who denied the divinity of Christ, as the Arians, denied her of course the title of Mother of God, and so did they who denied the humanity of the Word, as the Eutychians; while the Nestorians, asserting a double personality in Christ, allowed her only the maternity of the human hypostasis. Further disputes occurred about the perpetual virginity of Mary. The church insisted upon the belief that Christ was born of a virgin mother, in accordance with the Apostles’ Creed, reaffirmed by the Nicene and Athanasian symbols; and the council of Ephesus decreed expressly that Mary was the mother of God (*Θεοτοκος*), and condemned all who denied her that title. The Cerinthians taught first that Christ was born of Joseph and Mary, and their doctrines were repeated by Helvidius in Palestine, and Donatus

in Illyria, their later followers adding that several children were born to Joseph and Mary after the birth of Jesus. Questions existed, until silenced by authority, between Catholic schools of theology, as the Thomists and Scotists, and between certain religious orders, as the Franciscans (who followed Scotus), and the Dominicans (who upheld St. Thomas), in reference to Mary’s conception, which the former held to have been utterly immaculate of all sin, and the latter maintained not to have been immaculate, or not at least from the earliest instant of her existence. The solicitude of the Roman Catholic church in deciding all such questions was doubtless caused by its anxiety to preserve from ambiguity and uncertainty its dogmatic statement of the doctrine of the incarnation of the Word; and it has happened that the most strenuous attacks upon the Catholic position of the Virgin have come from those who differed with the Catholic church touching its views of the Son’s incarnation.—Many festivals are celebrated in the Roman Catholic church in honor of Mary. Her conception is commemorated by the feast of the Immaculate Conception (Dec. 8); her birth by the Nativity (Sept. 8); the message of the angel by the Annunciation (March 25); her visit to Elizabeth by the Visitation (July 2); her visit to the temple by the Purification (Feb. 2); and her ascent to heaven by the Assumption (Aug. 15). The Nativity and Assumption are celebrated by both Greek and Latin churches. In the 11th century one day of the week (Saturday), and later an entire month (May), were especially consecrated to Mary. An *Officium Beatae Mariae Virginis* was added to the breviary, and declared by Pope Urban II. (1095) obligatory for the clergy of the whole church. Several religious orders called themselves after Mary. To the intercession of Mary so great importance is attributed that the *Ave Maria* (Hail Mary) is generally used in connection with the Lord’s prayer. Many devotional exercises in honor of Mary, especially the beads or rosary (see BEADS), are in common use; and the wearing of the scapular, which Mary is believed to have given to the general of a religious order, Simon Stock, with the promise of special favors to all who wear it in her honor, was encouraged by several popes, who attached to it many indulgences. The house in which Mary dwelt at Nazareth is believed in the Roman Catholic church to have been miraculously transported by angels to Loretto. The miraculous cures ascribed to the intercession of Mary are innumerable; a collection of some belonging to recent times may be found in the “Annals” of the “Archconfraternity of the Immaculate Heart of Mary,” an association which was established at Paris in 1880. Many towns in every Catholic country possess celebrated images of Mary, which attract crowds of pilgrims during the year or on stated festivals.—See St. Ildelphonsus, *De illibata ac perpetua Virginitate Genitricis Dei Mariae* (Valentia, 1556); Seg-

neri, *Il Diceto di Maria*, frequently republished in Italy; Ventura, Faber, Muzzarelli, &c.; St. Liguori, "The Glories of Mary," translated into English and frequently reprinted; "Life of the Blessed Virgin Mary," translated from the French of the abbé Orsini by Mrs. J. Sadlier (8vo., New York); "Life of the Blessed Virgin Mary," translated from the Italian of Gentiluoci (8vo., New York); the Rev. T. Joslin, "Life of the Blessed Virgin" (New York, 1859); the Rev. T. S. Preston, "The Ark of the Covenant" (New York, 1860).

MARY I., first queen regnant of England and Ireland, fourth sovereign of the Tudor line, and daughter of Henry VIII. and of Catharine of Aragon, born at Greenwich palace, Feb. 18, 1515-16, died at St. James's palace, Nov. 17, 1558. She was severely educated, according to a code of instructions drawn up by Ludovius Vives. She was the object of various matrimonial negotiations in her infancy; it was proposed that she should marry the dauphin, son of Francis I. of France, and she was betrothed to the emperor Charles V. when in her 7th year. He desired that she should be sent to Spain for education, but her parents would not consent to part with her, though they gave her a Spanish education. Her father was at that time passionately attached to her, declaring her heir to the crown, and, according to one authority, creating her princess of Wales. She had a magnificent court at Ludlow castle, her chamberlain being that Dudley who in after days sought to prevent her from ascending the throne, and whom she sent to the scaffold. The countess of Salisbury, the last of the Plantagenet family, was at the head of her establishment. The emperor broke his contract with her on the ground that her father, by seeking a divorce from her mother, was seeking also his daughter's degradation. Henry then sought to marry her to Francis I., but that prince took for his 2d wife the emperor's sister Eleanor. Catharine wished her daughter to marry a son of Lady Salisbury, whose brother, Warwick, had been murdered by Henry VII. on the demand of Ferdinand of Aragon, before he would consent that his daughter should marry a prince of the house of Tudor. This son was the famous Reginald Pole, who was attached to Mary. Her hand was asked for the duke of Orleans, second son of Francis I., but vainly. After the birth of Elizabeth, Mary was degraded from the position she held; and when James V. of Scotland asked her in marriage, his suit was refused, from the fear that issue from such union would interfere with the title of Anne Boleyn's children to the crown. As she resisted as far as she could, it was reported that her father was indignant, and that her life was in danger. The treatment she received justified the fears that were entertained, and the emperor interfered in her behalf. After Anne Boleyn's death Mary was better treated; but her father's object, which was a renunciation of her right to the succe-

sion, was not obtained until some time after this change, when she signed articles acknowledging that her mother's marriage was incestuous and illegal, her own birth illegitimate, and the king's supremacy over the church absolute. She was then restored to some favor. Her hand was again asked for the duke of Orleans, and she stood sponsor to the young prince who was afterward Edward VI. Negotiations for her marriage with various princes were fruitlessly made, among them being the prince of Portugal, the duke of Cleves, and the duke of Bavaria. As she was regarded as the head of the Catholic party, she was an object of suspicion to her father and to the Protestants, and her situation was made painful by the legal slaughter of most of her friends, including the countess of Salisbury; but in 1544 she was restored to her place in the line of succession by act of parliament. She lived on the best terms with her last stepmother, Catharine Parr, and at her instance translated Erasmus's Latin paraphrase of St. John. During the reign of Edward VI. she took no part in politics, though she was denied the free enjoyment of her religion. Suitors for her hand continued to present themselves—the duke of Brunswick, the margrave of Brandenburg, and the infante of Portugal. The emperor threatened war if she were not exempted from the penalties prepared for non-conformists, and she was suspected of intending to take refuge at his court. On the death of Edward VI. Mary succeeded to the throne, after a brief but unimportant struggle with the partisans of the Dudleys and Greys, who had set up Lady Jane Grey as queen. She was merciful to the fallen, only 8 persons being executed for treason; and she refused to bring the lady Jane to trial, saying that she was merely a tool of Northumberland. A reaction in the government took place, for which the queen was less blamable than her councillors, the principal of whom was Bishop Gardiner, lord chancellor. Mary interfered to prevent the perpetration of cruelty by the privy council, and the early part of her reign was of a mild character. Her coronation took place Oct. 1, 1558. Her first parliament met 4 days later, and restored the laws relating to life and property to the state they were in at the 25th of Edward III., and annulled all the acts that cast a stain on the queen's legitimacy. The religious laws of Edward VI. were repealed, and the church of his father was restored, making Mary its head, much against her will; but while she held the post, the Protestants were not persecuted. Lady Jane Grey was attainted, but it was known that the queen intended to spare her life. Mary's resolution to marry Philip of Spain caused great alarm to her subjects. Formidable insurrections broke out, which were not quelled without much exertion, and in the course of the brief rebellion the queen showed both courage and capacity. The effect of this struggle was to give entire ascendancy to the reactionary party in the royal councils. The death

warrants of Lady Jane Grey and her husband, and of other persons, were signed; and the queen was urged to put to death her sister Elizabeth and the earl of Devonshire, who, however, were only sent to the tower. When her ministers would have punished the rebels with that sweeping slaughter which characterized most of the Tudor reigns, she interfered, and saved their lives. The marriage of Mary and Philip took place July 25, 1554. It proved fatal to Mary's peace, and most injurious to her character and reputation. England and Rome were reconciled, and those persecutions were commenced which have made of Mary's reign a by-word and a reproach; but according to many historians they were due to the influence of Gardiner and Bonner, the queen being ill most of the time. Ranke, however, gives credit to Gardiner's assertion, that the queen herself, and not he, insisted on the revival of the old laws against the Lollards; and though he admits that many of the horrors of their execution may have been kept from her, he adds that no apology will free her memory from the dark stain that clings to it: "for whatever is done in the name of a prince, with his will and by his authority, decides his reputation in history." Mary was neglected by her husband, to whom she was warmly attached. For his sake she involved her country in a war with France, against its interests, and English forces took part in the battles of St. Quentin and Gravelines. The French captured Calais, which the English had held for more than two centuries. War with France brought on war with Scotland. The loss of Calais was so mortifying to the English, that they insisted that Philip should make no peace with France without providing for its restoration; and it was with reference to the trouble which this caused her, that Mary said "she should die, and if her breast was opened, Calais would be found written on her heart." Her health had never been good, and she was indisposed during the greater part of her reign, of which circumstance her council took advantage. She suffered from dropsy and nervous debility, and her disappointment from not having children aggravated her illness. She recognized Elizabeth as her successor. In the summer of 1558 she was attacked by intermittent fever, by which thousands of her subjects had died, the consequence of the wet seasons that prevailed throughout her reign. When it was evident that her last hour was at hand, her court was deserted, most of its members hastening to Hatfield, the residence of Elizabeth. She was buried, on Dec. 14, in Henry VII.'s chapel.

MARY II., first queen regnant of Great Britain and Ireland, daughter of James II. and wife of William III., born at St. James's, April 30, 1662, died at Kensington palace, Dec. 28, 1694. Her father, at the time of her birth, was heir presumptive to the throne and duke of York, and her mother was Anne Hyde, daughter of the earl of Clarendon. She was educated at

Richmond palace, with her sister Anne, her preceptor being Henry Compton, bishop of London, who, though he could not have imparted to her much knowledge, was so fortunate as to acquire a strong influence over her mind, which had serious effects in later life. The persons employed under him were successful in their labors, as the princess was a very well educated woman for those times. She was married to her cousin, William, prince of Orange, Nov. 4, 1677, an alliance which was very popular throughout Great Britain. It was not, however, for some years, productive of happiness to the parties to it. Mary's father, as heir presumptive to the British crown, was an object of jealousy to all Protestants except the high churchmen, and even they saw with pleasure that his heir, the princess of Orange, was strongly attached to the church of England. William was jealous of his wife's position, as, should she succeed to the throne, she would be his superior in rank and power; and should she die before him, and childless, the throne would pass to her sister Anne. William stood next in the order of succession to Anne, and all hope of Charles II. having legitimate offspring had long been abandoned. The prince was not an affectionate or a faithful husband, but the personal difficulties between him and his wife were removed before those of a political character were known to her, for she was ignorant of the superior position she was likely to hold with reference to her husband. Burnet, afterward bishop of Salisbury, effected a complete reconciliation between the prince and princess, the latter pledging herself to surrender all power to her husband, should circumstances ever place her on the British throne, a promise she would have found it difficult to keep had affairs taken the regular course. When William found himself compelled to take the leadership of that comprehensive opposition party which was formed in England against James II., in 1687-'8, he was strenuously supported by Mary against her father. Even had not the obligation to her husband been superior to that to her father, there was much in the conduct of the latter to excuse her course. He had never, since her marriage, treated her well, had used some of her friends harshly and illegally, and had conspired to take from her the crown of Ireland; and she shared in the common belief that the prince of Wales, born in 1688, was a supposititious child, who had been introduced into the royal family to prevent her from ever enjoying her inheritance. She acquiesced in the plan for the invasion of England in 1688; and when the earl of Danby sought to obtain the throne for her on the ground that there had been a demise of the crown, and that she was the next heir, she wrote him an earnest reprimand, declaring that she was the prince's wife, that she had no other wish than to be his subject, that the most cruel injury that could be done to her would be to set her up as his competitor, and that she never could regard any per-

son who took such a course as her true friend. Could William have had his way, he would have reigned alone, and Mary would have been only queen consort; but the opposition to this plan was so great, that it was never pressed. The convention parliament declared William and Mary king and queen of England. Mary arrived in England on Feb. 12, and on the 13th she and her husband accepted the crown. The levity of her conduct on reaching Whitehall shocked persons of all parties; but it was adopted in order to please William, who had written to her to adopt an air of cheerfulness, as her friends had stated that she thought she was wronged, and the report would be confirmed if she wore a gloomy countenance; and she overacted the unnatural part she had assumed. She was called Goneril and Tullia by the Jacobites, and became the object of innumerable lampoons. The coronation took place April 11, 1689, when Mary was inaugurated like a king. During the absence of her husband, when in Ireland or on the continent, Mary was placed at the head of the government, and in that position showed tact and firmness under very trying circumstances. In 1692, after the naval victory of La Hogue, she declared that Greenwich palace, then in course of construction, should be converted into a retreat for those seamen who should be disabled in their country's service; and the vow thus made was kept. Toward the end of 1694 she was attacked by small pox, of which she soon died, to the great grief of her husband, to whom her decease was a political as well as personal loss, as her participation in his government gave to it a certain show of hereditary right. The attacks of the Jacobites on her unflinching conduct continued even after her death. She was buried with great pomp in Henry VII.'s chapel in Westminster abbey.

MARY OF MEDICI. See MARIA DE' MEDICI.

MARY MAGDALEN, probably so called from Magdala, a town of Galilee. She is commonly supposed to be the "woman, who was a sinner," of whom St. Luke (ch. vii. 37, 38) relates that as Jesus sat at meat in the house of Simon the Pharisee she washed his feet with tears and wiped them with the hairs of her head, and anointed them; but there is no evidence that this is the same person whom St. Luke mentions in the next chapter among the women who "ministered unto him of their substance" as "Mary called Magdalene, out of whom went seven devils." The supposition has also been entertained that she is identical with Mary the sister of Martha and Lazarus; but beyond the similarity of name, the affectionate devotion to Jesus Christ which distinguished both, the fact that the sister of Martha also anointed the feet of Jesus, and the opinion of some of the early fathers, among whom are Clement of Alexandria and St. Gregory the Great, no foundation for it has been assigned. Mary Magdalen stood by Jesus on the cross, and was present when Joseph of Arimathea laid him in the sepulchre. On the first day of the week she came early to the

tomb, and finding it open ran and told Peter and John that they had "taken away the Lord out of the sepulchre." Returning to the place with these apostles, she saw "two angels in white sitting, the one at the head, and the other at the feet, where the body of Jesus had lain." Immediately afterward Christ himself appeared to her, and announced his approaching ascension. Of her subsequent life nothing is known, but it is the theme of numerous legends. One of these, representing her as the sister of Martha and Lazarus, tells how she went with those two disciples into what is now Provence; and the story was deemed worthy of a long discussion by the authors of the *Acta Sanctorum*, in which finally nothing was decided. The tradition that she passed the latter part of her life in penitential exercises in the desert has been a favorite subject in the arts, and was treated by Guido, Correggio, Canova, and many other great masters.

MARY STUART, queen of Scots, born in the palace of Linlithgow in Dec. 1542, beheaded at Fotheringay castle, Northamptonshire, England, Feb. 8, 1587. The precise date of her birth is unknown, for though it is commonly stated Dec. 8, documents recently discovered afford ground for the belief that the event must have occurred on the 11th or 12th of that month; and it was probably antedated on account of the 8th being one of the four great festivals of the Catholic church in honor of the Virgin, whose name was given to the child. She was the daughter of James V., 7th king of the Stuart line, and of Mary of Lorraine, daughter of Claude, duke of Guise, the founder of that family which had so conspicuous a part in the politics of France in the 16th century. Her birth took place at one of the dreariest periods of Scottish history, her father dying when she was but a few days old (Dec. 18), of mortification consequent on the defeats which the Scotch had voluntarily met with from the English at Fala and Solway Moss, the nobles being opposed to his policy. The earl of Arran, head of the house of Hamilton, and heir presumptive to the throne, was made regent by the parliament. Mary was crowned Sept. 9, 1543, at Stirling. Henry VIII. of England demanded her hand for his son, the prince of Wales, afterward Edward VI., he being anxious to accomplish the politic purpose of his father, which was to effect a union of the two crowns by marriage. At first he was successful, and a treaty was made, July 1, 1543, providing that Mary should be sent to England when she should have attained the age of 10 years, and that she should marry Edward as soon thereafter as possible. In 5 months this treaty was broken, the French and Catholic party triumphing over the English and Protestant party. An alliance was made with France, Dec. 15, and Henry declared war against Scotland, which his troops invaded. After his death, the protector Somerset continued his policy, and defeated the Scotch in the battle of Pinkie, Sept. 10, 1547.

Meantime the queen had lived at Stirling castle, with her governors, Lords Erskine and Livingston; but after the battle of Pinkie she was taken to the monastery of Inchmahome, on an island in Lake Menteith. Her mother and the regent Arran betrothed her to the dauphin of France, son of Henry II., and she sailed to that country from Dumbarton, Aug. 7, 1548, and arrived at Brest on the 18th. She was accompanied by four young ladies, Mary Livingston, Mary Fleming, Mary Beaton, and Mary Seaton, who were called "the four Marys." She was warmly received by Henry II., who treated her as a daughter. The French court was brilliant, learned, and licentious, love and letters commanding the attention of those who composed it. Mary profited in an eminent degree by the advantages it afforded for the acquisition of knowledge. Her Latin master was George Buchanan, one of the first scholars of the 16th century; and Ronsard taught her poetry. At 13 she pronounced a Latin oration which was much applauded. In 1551 her hand was formally demanded of Henry II. for Edward VI., but she herself refused to listen to the demand. The wide-spread dominion and power of the Spanish branch of the house of Austria having increased the fear of the house of Valois, Henry II. determined to complete his alliance with Scotland, and the dauphin Francis and Mary were married, April 24, 1558. The open conditions of the marriage were honorable to Scotland; but there were two secret acts, which were of grave moment. By the first, Mary gave Scotland to the sovereigns of France, in reward for the services Henry II. and his predecessors had rendered that country against the English; and by the second, she provided against the non-execution of the first. She also conveyed to Henry any claims that might accrue to her upon England and Ireland. Henry was to have the usufruct of Scotland until he should have repaid himself for what he had expended in her defence. These debts had never been accepted by Scotland. Mary had secretly protested in advance against the engagements she had entered into with her own subjects, and declared her wish to annex Scotland to France. The Scotch bestowed the crown matrimonial on Francis, and it was provided that all acts should be published in the name of Francis and Mary, king and queen of Scotland, dauphin and dauphiness of Vienne. When Mary I. of England died, Nov. 1558, Henry II. caused the dauphin to quarter the arms of England with those of Scotland, as he believed, or affected to believe, that Mary Stuart was legitimate heir to the English crown, as descended from Margaret Tudor, eldest daughter of Henry VII., Elizabeth, daughter of Henry VIII. by Anne Boleyn, having been declared a bastard. This act was the cause of most of the trouble that afterward befell the Scottish queen. Henry II. dying July 10, 1559, Mary became queen of France, a position she held not quite 17 months, her husband, Francis II., dying Dec. 5, 1560.

During his short reign, the Guises, who led the Catholic party, were masters of the kingdom, ruling the king through their influence over his wife, their kinswoman. Suitors for her hand soon appeared—the kings of Sweden and Denmark, and Philip II. of Spain, who wished her to wed his son and heir Don Carlos. She was coldly treated in France, where Catharine de' Medici, who was never her friend, had control of the government; and she resolved to return to Scotland. In that country, the French Catholic party had been overthrown, and the English Protestant party had triumphed, aided by Elizabeth's forces. By the treaty of Edinburgh, July 5 and 6, 1560, it was provided, among other things, that the French should leave Scotland, and that the Scotch sovereigns should cease to bear the arms and title of the sovereigns of England. Mary had eluded the ratification of this treaty. When she resolved to return to Scotland, she applied to Elizabeth for a safe-conduct through England, but it was refused, unless she would ratify the treaty of Edinburgh. Mary then embarked at Calais, Aug. 14, 1561, and arrived at Leith on the 19th, escaping the English cruisers. She left France with bitter regrets, and was herself much regretted there. Poets expressed the common feeling, and her own *chanson* bidding adieu to the country is universally known. On her arrival in Scotland, she found power in the hands of the Protestants, and submitted to what it was impossible to resist. Her chief ministers were her natural brother, the lord James Stuart, and Maitland of Lethington, who were among the ablest statesmen of the century. She expressed herself favorable to toleration, and asked it for herself, but obtained it with difficulty. Her position was one of great embarrassment. Sincerely Catholic, she was the sovereign of a people who had accepted the reformation, and who had displayed the utmost enmity to the old faith. The intolerance of the majority made the minority all the more devoted to their opinions. John Knox, the ablest of all the reformers after Luther and Calvin, used strong language to the queen, denouncing the mass, and insisting on the right of subjects to resist sovereigns. Her joyous modes of life were regarded with abhorrence by most of her subjects, and prepared them to believe the worst that could be alleged against her. Still her reign for some time was prosperous. Her brother, who was at that time attached to her, counselled her wisely, and acted vigorously. The rebellious Gordons were conquered. A good understanding with Elizabeth was effected, and preparations for a meeting of the two queens were partially made. Circumstances made it advisable that Mary should marry. Elizabeth wished her to marry the earl of Arran, but to this Mary would not consent. She desired to become the wife of Don Carlos of Spain, and refused the dukes of Nemours and Ferrara; but the Spanish marriage met with so much opposition, both at home and abroad, that she had to abandon all idea of it.

She was urged to accept the hand of the archduke Charles, 8d son of the emperor of Germany, Ferdinand I., but the proposition found no favor with her. Elizabeth then suggested Lord Robert Dudley, better known as the earl of Leicester, which Mary regarded as an insult; nor is it probable that Elizabeth was sincere in the proposition, and her object was, it may be supposed, to keep Mary in the same state of singleness to which she had doomed herself. Mary finally solved the difficulty by determining to marry the lord Henry Darnley, son of the earl of Lennox. Darnley was nearly related to both queens, as his mother, the countess of Lennox, was the lady Margaret Douglas, daughter of the earl of Angus and of Margaret Tudor, widow of James IV. of Scotland. He was handsome and accomplished, but he was of a fickle mind, and his talents were small. The Catholics favored the match, and the Protestants opposed it; and so powerful were the latter that, headed by the queen's brother, who had been created earl of Murray, and Lethington, they would have triumphed, and Mary would have married Leicester, could Elizabeth have been prevailed upon to recognize her as her heir. The Scotch statesmen, who were supported by some of the English statesmen, exerted themselves to have this recognition made; but Elizabeth desired that Mary should first accept Leicester. This caused Mary to persevere in her design, which, however, met with much opposition from Murray and others. Murray retired from the court, nor could Mary induce him to return to her service, or to consent to her marriage with Darnley. He resorted to deeds of violence in keeping with those of the Scotch aristocracy generally, and from that time must be dated his separation from his sister. Elizabeth continued her opposition to the marriage, and sent to propose to Mary to choose either Leicester, or the duke of Norfolk, or the earl of Arundel. But neither her opposition, nor the extreme measures of the church of Scotland, nor the lawless proceedings of Murray and others, could now avail to stop the marriage. Darnley had been created lord of Ardmanach and earl of Ross, and on July 20, 1565, he was made duke of Albany; and 9 days later the marriage took place. On the previous day Mary had conferred on him the title of king. The alliance must have been popular in Scotland, or Mary could not have triumphed in opposition to so many powerful influences; but it caused dismay in England. Murray headed a rebellion, relying on English assistance; but Mary's energetic proceedings led to his prompt defeat, and the assertion of the royal authority. Unfortunately, her success led Mary to entertain the idea of overthrowing Protestantism, whereas she had succeeded only because her subjects had believed her to be upholding the existing system against the designs of a few ambitious and selfish nobles. She put herself in communication with the courts of France and Spain, and with the pope. From Spain and Rome she received some money, but Philip II. could afford

her no military assistance, though he intimated that he might furnish it at a future period. Mary now assumed a high tone toward Elizabeth; and as she was supported by the French and Spanish ambassadors, the English queen had to abate her pretensions. She even denounced Murray to his face for his rebellion, though she had aided and abetted him in it. Murray was desirous of pardon, and appears to have been sincerely anxious to return to his allegiance. But Mary was resolved on his destruction, and on that of most of his associates. She was now much under the influence of David Rizzio, one of those clever Italian adventurers who then swarmed over Europe, and who filled every kind of employment in all countries, from that of the statesman to that of the spy. The queen's love for Darnley was of brief endurance, his worthlessness having soon become apparent. They quarrelled, and Darnley affected to believe he had been dishonored by Rizzio. Darnley wished for the crown matrimonial, meaning an equal share in the royal authority, which Mary had promised him in the days of their attachment. This promise she now refused to keep, and Darnley attributed her decision to Rizzio. He conspired to effect his destruction, the chief conspirators under him being Lord Ruthven, head of an ancient family, the earl of Morton, chancellor of Scotland, the earl of Lennox, Darnley's father, Lethington, Lord Lindsay, and John Knox. The plans of the conspirators were very comprehensive, the murder of Rizzio being but an item in them, for the gratification of Darnley, and because the Italian was known to be a strong enemy of the reformation, then struggling for existence, Mary herself having formally given her adhesion to the party of reaction by joining the league of the Catholic sovereigns of the continent to exterminate Protestantism. The English party was to be restored to power; Murray was to be recalled and placed at the head of the government; Darnley was to be made nominal king; Mary was to be imprisoned, the exiles were to be restored, and Rizzio was to be murdered. These details show that Darnley was not the real framer of the conspiracy, and they were the work of Morton, a man as skilful as he was unscrupulous, and who was not only strongly attached to the reformation, but feared to lose the church lands it had been the means of his acquiring, and also his office. The conspiracy was known to Elizabeth and her ministers. On the evening of March 9, 1566, several of the conspirators entered the room where Mary was supping, with Rizzio and others, in Holyrood palace, and dragged the Italian to the entrance of the presence chamber, on the stairs of which he was slain, receiving 56 wounds. Darnley was one of the most active of those who entered the queen's cabinet, and it was by him that Rizzio was torn from the hold he had on the queen's garments, and he held her while his associates despatched the Italian. Mary was for a time the prisoner of the conspirators,

but by deceiving Darnley she effected her escape. Murray returned, and while she was reconciled to him and his immediate friends, she pursued the murderers of Rizzio with implacable resentment. Seventy of them, headed by Morton, fled to England; Lennox was banished from the court, and Lethington deprived of his office. She no longer disguised her hatred of Darnley. On June 19 she gave birth to her only child, afterward James VI. of Scotland, and James I. of England. At this time her connection with the earl of Bothwell commenced. He was a powerful nobleman, bold, unscrupulous, and accomplished, and it was natural that Mary should wish to secure his services; but her enemies charge that she entertained a criminal passion for him. Be that as it may, she showed him high favor, while she treated her husband more contemptuously than ever. A plan for the destruction of Darnley was formed by Lethington, who wished to gratify the queen by ridding her of her husband, either by divorce or by murder, and to effect the restoration of Morton and his associates. Bothwell joined the conspiracy, as did other great nobles. Murray did not oppose it. It is charged that it was communicated to the queen, and that she offered no serious opposition to it. A bond to cut off the king, and to protect each other, was drawn up and signed by the conspirators. Morton, on his return, was ready to join them if he could have the queen's written warrant, which Bothwell sought to obtain, but unsuccessfully. Darnley was now ill of the small pox at Glasgow. There he was visited by Mary, and a reconciliation was apparently effected. On his recovering sufficiently to travel he was removed to the provost's house at Kirk of Field, near Edinburgh, where Mary attended him with much apparent kindness, passing several nights under his roof. This house was blown up on the night of Feb. 9, 1567, while the queen was attending a masquerade at Holyrood palace. Of Bothwell's guilt of this murder there is no doubt whatever, but Mary's part in it is not so clear; and the main point in that "Marian controversy" which has continued to the present time turns upon the question of her participation in Bothwell's conspiracy. The impression at Edinburgh was unfavorable to her, and did not lack expression; and her indifference, and her refraining from any exertion to punish those who were loudly accused by the general voice, deepened the belief in her guilt. Instead of complying with Lennox's demand for the arrest of Bothwell, she heaped favors upon the murderer. Public opinion, as pronounced both at home and abroad, compelled her to order that Bothwell should be tried; but his trial was a mockery, the government acting scandalously in his behalf, and he was acquitted. New and signal marks of favor were bestowed upon him, and the whole power of the government was in his hands. He sought to marry the queen, and was divorced from his wife, his object being the crown. At a tavern supper, to

which he invited many of the nobles and others, he procured, partly by intimidation and partly by falsehood, their signatures to a bond declaring him innocent, and recommending the queen to marry him. On April 24, while returning from Stirling to Edinburgh, she was seized by Bothwell, and conducted to his castle of Dunbar. She was allowed to return to Edinburgh on May 8, when Bothwell's divorce was completed. Her intention to marry him was then announced. He was made duke of Orkney, and on May 15 they were married. This marriage created universal disgust. A conspiracy which had been formed against Bothwell, composed of the chief nobles, now assumed a serious magnitude, and hostilities broke out early in June. The confederates seized Edinburgh, and when the two armies met on Carberry hill, June 15, Mary was deserted by most of her troops, and was compelled to surrender. Bothwell fled, and never returned. The queen was committed to Lochleven castle, where, on July 25, she signed an act of abdication in favor of her son, and other acts arranging the government, of which Murray was to be the head, as regent. These acts were extorted from her, and depended for their validity entirely upon the power of the confederates to maintain their position. Elizabeth denounced them and their conduct, but this did not prevent them from making the infant prince king. On Murray's return from France, he visited Mary, and by working on her fears he had the art to make her request him to accept the regency. Parliament passed an act virtually dethroning the queen, and charging her with being privy to Darnley's murder. On May 9, 1568, she made her escape from Lochleven, and succeeded in rallying a powerful force to her support, which was defeated at Langside, May 18, by Murray. Mary fled to England, which she entered May 16. There was no occasion for this course, which was the most unwise she could have adopted; and she might have gone to France, or have remained in Scotland. At first she was treated with some consideration by Elizabeth, but the latter assumed the part of judge between Mary and her opponents, and affected to decide on her guilt or innocence of the charges preferred against her. The examinations were unfairly conducted, and injured Mary's reputation. During the early years of her residence in England she was variously treated, and it was not until 1578, when her party in Scotland was finally overthrown, that she lost all hope of deliverance from that quarter. She was concerned in various attempts that were made against Elizabeth's government, and sought to marry the duke of Norfolk. She intrigued with the king of Spain, and with other foreigners of eminence, for the purpose of effecting her liberation; but for this she cannot be censured, as she was unjustly detained in England, and all the difficulties her presence caused there were owing to the conduct of Elizabeth and her ministers. The northern rebellion, headed by Northumberland

and Westmoreland, which was the last open effort made by the Catholics to restore the old faith, she discouraged. At one time, in 1571, Elizabeth was on the point of restoring her; but in 1572 she engaged in a treaty with the Scotch government for the surrender of Mary, who was to have been tried, condemned, and put to death. This plan failed through the death of the regent Mar, as it had previously failed through the deaths of the regents Murray and Lennox. Beside the duke of Norfolk, her hand was sought by Leicester, and Sir George Carey, a near relative of Elizabeth. Don John of Austria was also one of her suitors. She was confined in various places, her chief gaoler being the earl of Shrewsbury. In most cases her treatment was outrageous, and shows the extent of Elizabeth's personal hatred of the woman she had wronged, and that she desired to effect her destruction. Mary was the object of both the fear and the hatred of the reformers, and her death was demanded by them, through the ministers of Elizabeth and through parliament. She was believed to be the principal person in all the numerous conspiracies that were formed against Elizabeth, though with most of them she could have had no connection. An "association" was formed, directed not only against those who should do violence to Elizabeth, but also against those for whose benefit the crime should be committed. Parliament sanctioned this "association" in 1585. Babington's conspiracy was formed in 1586, one of the objects of which was to liberate Mary, who had some correspondence with Babington, in which no encouragement, however, was given to his designs against Elizabeth. This conspiracy early became known to Elizabeth's ministers, who nursed it, until even the queen became alarmed, and compelled the arrest of the assassins. It was then resolved to proceed against Mary, who had been removed to Fotheringay castle, Sept. 25, 1586. A commission, composed of 46 persons, was appointed to try her. At its head was the chancellor, Bromley, and the treasurer, Burleigh, was one of its members. The other members were all persons of eminence, either state officers, or peers, or lawyers. This commission, of which 11 members refused to act, met at Fotheringay castle on Oct. 11, 1586, and after overruling Mary's original determination not to acknowledge its jurisdiction, proceeded with the trial on the 14th. She defended herself with skill and success against the great array of talent on the other side, and the commissioners durst not come to a decision in her presence. They adjourned to Westminster, after sitting two days, and on Oct. 25 they unanimously declared her guilty. It was not until Nov. 19 that Mary was informed of their decision, and she heard it with calmness. Efforts to save her life were made by the governments of France and Scotland, but fruitlessly. The publication of the sentence of death, Dec. 4, in London, was received with extravagant demonstrations of joy. Parliament urged execution.

Elizabeth, however, was reluctant to proceed to extremities, and for 6 weeks the warrant for her execution remained unsigned in the hands of Davison; nor is it certain that she ever signed it. A warrant purporting to bear her signature was given by Burleigh and his associates to Beale, Feb. 8, 1587, but there is evidence that it may have borne that signature in consequence of a forgery effected by one Harrison, a clerk in the service of Secretary Walsingham, the most implacable and dishonest of Mary's enemies. An attempt to induce her gaolers to poison her, in which Walsingham and Davison were the principal instruments, had failed. On Feb. 7 the earls of Kent and Shrewsbury proceeded to Fotheringay castle, and informed Mary that she must prepare to die the next morning, at 8 o'clock. She was taken by surprise, but bore herself with characteristic firmness. She made all her preparations for death with deliberation, and at the appointed time proceeded to the scaffold, which had been erected in the banquetting hall. She was denied the presence of her almoner, and was rudely importuned to change her faith by the bigoted dean of Peterborough, and by the brutal earl of Kent, whose efforts she quietly but firmly repulsed. She died with heroic bravery; and even when the executioner at first struck her on the skull, inflicting a horrible wound, she did not shrink or groan. Two more blows were necessary to despatch her. After being contemptuously neglected for 6 months, her remains were buried in Peterborough cathedral, Elizabeth acting as chief mourner through Lady Bedford; and 25 years afterward they were removed to Henry VII.'s chapel, in Westminster abbey, by order of her son James I. When Elizabeth was informed of Mary's death, she expressed great indignation, forbade Burleigh and Walsingham her presence as the sole authors of the crime, and sent their principal tool, Secretary Davison, to the tower, and had him fined £10,000, equal to £70,000 at the present value of money. Davison's word is all the evidence that exists of Elizabeth having signed the warrant, and he was not only a witness in his own cause, but had been concerned in an attempt to induce Mary's gaolers secretly to poison her.—The question of Mary's guilt or innocence of the crimes charged against her has been vehemently debated for almost three centuries, and hundreds of works have been written on it, while she has been a favorite character with poets and novelists. The question seems no nearer to a solution now than it was in the early days of her residence in England, when it was debated by George Buchanan on the one side, and by Lesley, bishop of Ross, her champion, on the other. Among the numerous works in relation to Mary, we cite those of Lesley, "Defence of the Honor of Marie, Queene of Scotland and Dowager of France" (London, 1569); George Buchanan, *De Maria Scotorum Regina, &c.* (London, 1572; translated into English by Robert Leckprevik, 1572); William Udall, "Historie of the Life and Death of Mary,

Queen of Scotland" (London, 1624); William Sanderson, "Compleat History of the Lives and Reigns of Mary, Queen of Scotland, and of her son James VI." (London, 1656); Francis Walsingham, "Brief History of the Life of Mary, Queen of Scots" (London, 1681); Eliza Heywood, "Secret History of Mary, Queen of Scots" (London, 1725); James Anderson, "Collections relating to the History of Mary, Queen of Scotland" (London, 1729); De Marsy, *Histoire de Marie Stuart* (London and Paris, 1742-'8); Goodall, "Examination of the Letters said to be written by Marie, Queen of Scots, to James, Earl of Bothwell; also an Enquiry into the Murder of King Henry" (Edinburgh, 1754); Robertson, "History of Scotland during the Reigns of Queen Mary and of James VI." (London, 1759); Tytler, "An Enquiry, Historical and Critical, into the Evidence of Mary, Queen of Scots" (Edinburgh, 1760); Whitaker, "Mary, Queen of Scots, Vindicated" (2d ed., London, 1790); Caussin, *La vie, les amours, le procès et la mort de Marie Stuart* (Paris, 1792); Thomas Robertson, "History of Mary, Queen of Scotland?" (Edinburgh, 1798); George Chalmers, "Life of Mary, Queen of Scots," &c. (London, 1818); Miss Benger, "Memoirs of Mary Stuart" (London, 1822); Hugh Campbell, "The Case of Mary, Queen of Scots, and of Elizabeth, Queen of England" (London, 1825); and "Love Letters of Mary, Queen of Scots, and the Earl of Bothwell" (1825); Miss Strickland, "Letters of Mary, Queen of Scots" (London, 1842); and "Lives of the Queens of Scotland;" Prince Labanoff de Rostoff, *Lettres, instructions et mémoires de Marie Stuart, publiés sur les originaux et les manuscrits du State Paper Office* (London, 1845); J. M. Dargaud, *Histoire de Marie Stuart* (Paris, 1850); Ohéruel, *Marie Stuart et Catherine de Médicis* (Paris, 1856); Teulet, *Lettres de Marie Stuart*.

MARYLAND, one of the original states of the American Union, situated between lat. 37° 48' and 39° 44' N., and long. 75° 04' and 79° 33' W., having an extreme length E. and W. of 196 m., and a breadth varying from about 10 m. to 120 m.; area (not including Chesapeake bay), 11,124 sq. m., or 7,119,860 acres, being 0.88 per cent. of the total land area of the United States. It is bounded N. by Pennsylvania, from which it is divided by a parallel known as "Mason and Dixon's line;" E. by Delaware and the Atlantic ocean, on which it has a shore line of 88 m.; S. and S. W. by Virginia, from which it is divided in the Accomac peninsula by a line E. from the mouth of the Potomac to the Atlantic, and on the mainland by the Potomac to the head of its N. branch; and W. by Virginia, the dividing line being the meridian of the head of that branch of the river. The state is divided into 21 counties, viz.: on the "eastern shore," Caroline, Cecil, Dorchester, Kent, Queen Anne, Somerset, Talbot, and Worcester; on the "western shore," Anne Arundel, Baltimore, Calvert, Charles, Harford, Howard, Montgomery, Prince George, and St. Mary's; and in

the "north-west," Alleghany, Carroll, Frederick, and Washington. The chief cities and towns are Annapolis, the seat of government, Baltimore, the chief commercial and manufacturing city, Ellicott's Mills, Port Tobacco, Havre de Grace, Port Deposit, Elkton, Chesapeake City, Chestertown, Easton, Cambridge, Frederick City, Boonsborough, Westminster, Hagerstown; and in western Maryland, Cumberland, the central depot of the Alleghany mining districts.—The population of Maryland, according to the federal census returns, has been as follows:

| Census years. | White persons. | Free colored. | Slaves. | Total population. |
|---------------|----------------|---------------|---------|-------------------|
| 1790..... | 208,649 | 8,048 | 108,086 | 819,723 |
| 1800..... | 246,826 | 19,587 | 103,685 | 841,548 |
| 1810..... | 265,117 | 28,937 | 111,502 | 880,546 |
| 1820..... | 260,228 | 28,780 | 107,397 | 407,850 |
| 1830..... | 291,108 | 52,938 | 108,994 | 447,040 |
| 1840..... | 313,304 | 68,078 | 89,737 | 470,919 |
| 1850..... | 417,948 | 74,728 | 90,868 | 583,684 |

Ratio of increase from 1790 to 1800, 6.82 per cent.; 1800 to 1810, 11.42; 1810 to 1820, 7.04; 1820 to 1830, 9.74; 1830 to 1840, 5.14; and 1840 to 1850, 24.04. Ratio to the total population of the United States in 1850, 2.51 per cent.; to the square mile, 52.41. Of the total white population in 1850, 211,187 were males and 206,756 females; of the free colored, 35,192 were males and 39,531 females; and of the slave, 45,944 were males and 44,424 females. Of the free colored, 61,109 were blacks and 18,614 mulattoes; and of the slaves, 82,479 blacks and 7,880 mulattoes. The free population, white and colored (492,666), inhabited 81,708 dwellings, and constituted 87,384 families. Deaf and dumb (1850), 261; blind, 323; insane, 546; idiotic, 391. Ages: under 1 year, 16,482; 1 and under 5, 69,162; 5 and under 10, 78,269; 10 and under 15, 72,376; 15 and under 20, 61,748; 20 and under 30, 106,125; 30 and under 40, 74,531; 40 and under 50, 48,698; 50 and under 60, 29,581; 60 and under 70, 16,455; 70 and under 80, 9,959; 80 and under 90, 2,057; 90 and under 100, 447; 100 and upward, 181; unknown, 18. Of those over 80 years old, 1,451 were white, 628 free colored, and 556 slaves; over 100, 17 white, 59 free colored, and 55 slaves. Of the total free population (492,666), 488,916 were born in the United States, 53,288 in foreign countries, and 462 in unascertained parts; and of those born in the United States, 400,594 were natives of Maryland, 16,076 of Pennsylvania, 7,080 of Virginia, 4,873 of Delaware, 2,646 of New York, 1,940 of the district of Columbia, 1,421 of Massachusetts, and 1,321 of New Jersey. Of the foreign population there were from Germany, 27,140; England, 8,467; Scotland, 1,093; Wales 260, and Ireland 19,557—total from the United Kingdom, 24,377; France, 500; West Indies, 279; British America, 215; Holland, 106. Of 124,876 free male persons over 15 years of age returned by the census of 1850 as engaged in industrial pursuits, 47,616 were employed in commerce, trade, manufactures, mechanic arts, and mining; 28,588 in agriculture; 82,102 in

labor not agricultural; 67 in the army; 9,740 in sea and river navigation; 2,059 in law, medicine, and divinity; 2,442 in other pursuits requiring education; 963 in government civil service; 1,021 in domestic service; and 278 in pursuits the nature of which is not specified. The number of persons employed in manufacturing establishments, &c., in 1820, was 18,640; in 1840, 21,825; and in 1850, 30,124. The number of slaveholders in the state in 1850 was 16,040; viz.: holders of 1 slave, 4,825; of 1 and under 5, 5,331; of 5 and under 10, 3,327; of 10 and under 20, 1,822; of 20 and under 50, 655; of 50 and under 100, 72; of 100 and under 200, 7; and one of between 300 and 500 slaves. The number of persons (white and free colored) born in the census year and living June 1, 1850, was 14,086, or 2.87 per cent. of the classes referred to; married in the same year, 8,708 couples, or 0.75 per cent.; died, 8,109, or 1.65 per cent. The total deaths, including slaves, amounted to 9,821, or 1.65 per cent. The federal representative population (all the free and $\frac{3}{4}$ of the slave) was 546,887, and entitled the state to 6 members of congress.—The sea coast, as before observed, has a length of only 33 m.; but including the whole tide water region of Chesapeake bay, the shore line is estimated at 411 m., and if the shores of islands be included, at 509 m. The principal rivers belonging wholly or in part to Maryland are the Potomac, Patuxent, Severn, Patapsco, Susquehanna, Elk, Choptank, Nanticoke, and Pocomoke. The rivers of the eastern shore, with the exception of the Choptank and Nanticoke, are rather inlets into which flow numerous small creeks than rivers, and are navigable only near their mouths. On the western shore, however, are the Potomac, navigable about 300 m.; the Patuxent, 50 m.; the Patapsco, 22 m.; and the Susquehanna, navigable beyond the Maryland boundary. Chesapeake bay, which almost bisects the state, extending northward within 14 m. of the frontier of Pennsylvania, receives nearly all the rivers of Maryland. At its mouth, between Cape Charles and Cape Henry, it is 15 m. wide, its opening facing E.; but on penetrating the land it almost immediately changes its direction; its length lying almost due N. and S. A little below the mouth of the Potomac it is about 30 m. wide, after which it again contracts, and at its head branches off into several small estuaries, just above the mouth of the Susquehanna. It is nearly 200 m. long, and navigable throughout. It contains many small islands, and its shores are indented with innumerable bays and inlets. The Atlantic coast of Maryland has no harbors, and is bordered throughout by a sandy beach from a few yards to more than $\frac{1}{2}$ m. in breadth, enclosing a shallow lagoon, which now, however, owing to the blocking up of several passages by which it formerly communicated with the sea, may almost be termed a fresh water bay or lake.—The surface of the eastern shore of Maryland, which forms part of the peninsula

lying between Chesapeake and Delaware bays, is low and level except in the N. part, where it is somewhat broken and rocky. The soil of this region is generally sandy. That part of the western division of the state which forms the peninsula between Chesapeake bay and the estuary of the Potomac presents the same natural features. The north-west is rugged and mountainous. The Blue Ridge, and other main ranges of the Alleghanies, cross it from Virginia into Pennsylvania. None of these chains attains a great elevation. In the variety of its geological formations and mineral productions, Maryland is one of the most remarkable states in the Union. Along the seaboard and the shores of the Chesapeake bay occur alluvial deposits of the present epoch. Next older are the beds of the pleistocene recognized in St. Mary's co., whence the formation extends southward along the coast of Virginia and North Carolina. The eastern shore is overspread almost exclusively with the clays, sands, and calcareous marls of the miocene; and the same formation is found on the W. side of the bay, reaching back to the E. edge of the metamorphic rocks, the line of which is commonly marked by the lowest falls of the rivers, as they descend from this platform of ancient rocks. The miocene formation is exposed in the banks of the creeks and rivers, and its beds of shell marl are there largely excavated for the valuable fertilizing materials they afford. Deposits of bog ore are found in this formation, as well as in more recent ones; and at a locality of the latter at Snowhill, in Worcester co., on the eastern shore, this ore has been profitably smelted for many years. (See BOG ORE.) Among the tertiary ferruginous sands and clays spread over the western shore, from the vicinity of Washington to the head of the bay, are numerous deposits of argillaceous carbonate of iron in flat bands and balls, which are largely worked for the supply of many blast furnaces. (See IRON.) The cretaceous formation enters the N. E. corner of the state from New Jersey and Delaware; but it is lost S. of the Susquehanna river. Immediately back of Baltimore are hills of metamorphic rocks, talcose and mica slates, and limestones, which extend N. E. and S. W. across the state. Among them are serpentine rocks, which constitute barren hills known as the "Bare Hills." In these, beds of chrome iron have been extensively worked, and their products have been converted into chrome pigments, and also exported to Europe. The same formations have yielded large quantities of the silicates and hydrates of magnesia. Mines of copper ore have also been worked in the metamorphic rocks, and others of hematite support numerous blast furnaces; in the same group of rocks are also extensive quarries of limestone and marble. At Sykesville on the Patapsco specular iron ore is found, and worked in connection with pyritous copper ores. Passing westward across the metamorphic belt, one meets included in it the narrow strip of the "middle secondary red sandstone," which

is traced from New Jersey through Pennsylvania and Maryland into Virginia. It passes through Carroll and the eastern part of Frederick co., crossing the Potomac just W. of Montgomery co. In this region was obtained from this formation the brecciated marble of which the pillars in the old hall of representatives in the capitol at Washington were made. In Frederick co., along the range of this belt, have been worked a number of copper mines. The portion of the metamorphic group lying W. of this trough of the middle secondary is but a few miles wide; and in the Catoctin and South mountains on the W. line of Frederick co. are found the silurian rocks, the Potsdam sandstones, and the Trenton and associated limestones, the lower members of the Appalachian system of rocks. The calcareous strata over-spread the E. portion of Washington co., extending N. in a broad belt into Pennsylvania and S. into Virginia. The finest valleys of the middle states lie on their range, and wherever met with these rocks give fertility to the soil and beauty to the scenery. Newer members of the Appalachian series of rocks succeed toward the W. to these lower formations, and are repeated with them in successive parallel ridges, which are the eastern members of the Appalachian chain. At Cumberland in Alleghany co. commences the ascent of the main ridges. Up their slope the middle silurian rocks soon give place to the red shales and sandstones of the devonian, and these are succeeded by the carboniferous formation, which caps the summits of Dan's and Savage mountains, and over-spreads the intervening valley of George's creek, as the strata dip in each direction into the trough-shaped basin. At Frostburg, Lonaconing, Westernport, and other points in the valley, is obtained the semi-bituminous coal known in the eastern markets as Cumberland coal, Cumberland being the point to which it was formerly brought by railroad or otherwise, to be shipped by the canal. This being now extended to Westernport, the coals of the basin are shipped direct by it, or taken by the Baltimore and Ohio railroad, which passes by Westernport, while the products of the mines near Frostburg are carried by railroad to Cumberland. Extensive iron works have been in operation at Mt. Savage, and also at Lonaconing, converting the iron ores of the coal formation into pig iron, and this into rails and other forms of wrought iron. The supply of ores, however, has proved uncertain, and, like most other attempts to found large operations upon these ores, the enterprises have not prospered. From this point to the W. boundary of the state the country continues mountainous, consisting of parallel ridges and valleys, the former capped by the coal formation or the underlying conglomerate and red and gray sandstones, and the valleys occupied by the coal measures.—The soil of the eastern shore is not naturally rich, but by the aid of manure it may be made to yield abundant crops. The beds of marl which are found in the

state furnish an excellent fertilizer. On the other side of the bay a tract closely resembling this lies along the shore. It has been much improved of late years by the use of marl, bone dust, and guano, and forms the chief tobacco-growing region of the state. Some of the valleys of the interior and northern counties are extremely fertile. The climate is temperate, and in most places salubrious, although the lowlands bordering on the bay are subject to miasmata which produce bilious fevers and agues. The commonest forest trees are the oak, hickory, chestnut, pine, locust, walnut, cedar, gum, and beech. Cotton, raised in the S. part of the eastern shore, tobacco, and especially wheat and Indian corn, are the staple cultivated crops. Maryland is the third tobacco-growing state in the Union as far as absolute quantity is concerned, while in proportion to its population it is the second. Oats, rye, buckwheat, barley, peas, beans, Irish and sweet potatoes, hops, flax, hemp, hay, dairy produce, wine, beeswax, honey, maple sugar, molasses, wool, and silk are also produced. In 1850 there were in the state 21,860 farms and plantations, covering 4,634,356 acres, of which 2,797,905 acres were improved and 1,836,445 unimproved lands, valued at \$87,178,545; and the value of implements and machinery thereon was \$2,468,443. The crops of 1849-'50 consisted of wheat 4,494,680, rye 226,014, oats 2,242,151, Indian corn 10,749,858, barley 745, buckwheat 108,671, Irish potatoes 764,989, sweet potatoes 208,998, and peas and beans 12,816 bushels; hay 157,956 tons; hops 1,870 lbs.; clover seed 15,217, and other grass seed 2,561 bushels; beeswax and honey 74,802 lbs.; flax seed 2,446 bushels; flax 35,686 lbs.; dew-rotted hemp 68 tons; maple sugar 47,740 lbs.; molasses 1,480 galls.; tobacco 21,407,497 lbs.; silk cocoons 39 lbs.; and wine 1,431 galls. The value of market garden products was \$200,869, and of orchard products \$164,051. The live stock owned in the state, June 1, 1850, consisted of 75,684 horses, 5,644 asses and mules, 86,856 milch cows, 84,135 working oxen, 98,595 other cattle, 177,903 sheep, and 852,911 swine; total value, \$7,997,684; value of animals slaughtered in the year preceding, \$1,954,800. The products of animals were: butter 3,806,160 lbs., cheese 8,975, and wool 477,438. The value of home-made manufactures was \$111,828. The total value of agricultural products was \$16,296,199. The average yield of the several staples to the acre in Maryland in 1849-'50 was: wheat 13 bushels, rye 18, Indian corn 28, oats 21, tobacco 650 lbs., Irish potatoes 75 bushels, and hay 1 ton; and the proportion of certain crops to the total of like crops in the United States was as follows: wheat 4.47 per cent., Indian corn 1.82, tobacco 10.72, wool 0.91, and hemp 0.18. The number of tobacco plantations on which 8,000 lbs. or upward of the leaf was grown was 1,726.—In 1810, the manufactures of Maryland were valued at \$8,879,861; in 1840 at \$18,509,636. In 1850, the number of manufacturing establishments was 5,708; total capital, \$14,758,143; hands,

80,194, viz: 32,641 males and 7,488 females; value of raw material consumed, \$17,524,784; cost of labor (wages), \$7,874,672; value of manufactured products, \$32,477,702. The statistics of the principal manufactures are shown in the following table:

| Establishments | Number | Capital | Hands | Value of products |
|-------------------------|--------|-------------|-------|-------------------|
| Cotton mills..... | 94 | \$2,284,000 | 2,093 | \$2,120,504 |
| Woollen mills..... | 38 | 944,000 | 803 | 282,140 |
| Pig iron works..... | 18 | 1,428,000 | 1,379 | 1,054,400 |
| Cast iron works..... | 26 | 259,000 | 761 | 835,000 |
| Wrought iron works..... | 17 | 478,000 | 408 | 771,431 |
| Breweries, &c..... | 34 | 247,100 | 181 | 229,756 |
| Tanneries..... | 116 | 833,900 | 479 | 1,100,180 |
| Flouring mills..... | 245 | 1,582,400 | 508 | 4,916,878 |
| Coal mines..... | 8 | 606,000 | 210 | 194,875 |
| Iron mines..... | 21 | 24,700 | 274 | 171,875 |

In foreign commerce Maryland occupies the sixth place in the Union, and is on an equality with Pennsylvania. The states having a larger amount of imports and exports are New York, Louisiana, Massachusetts, California, and Alabama. The value of exports for the year ending June 30, 1850, was \$6,967,853, of which \$6,589,481 was of domestic produce; that of imports was \$6,124,201. For the year ending June 30, 1850, the exports amounted to \$9,235,399, of which \$9,074,511 was domestic produce, and the imports to \$9,718,921. The shipping employed in this trade was as follows: entered in 1849-'50, 99,588 tons, viz: American 70,427, and foreign 29,161; cleared, 126,819 tons, viz: American 89,226, and foreign 37,528; entered in 1858-'9, 189,992 tons, viz: American 134,820, and foreign 55,172; cleared, 171,446 tons, viz: American 115,891, and foreign 55,555. The total shipping owned in the state in 1850 amounted to 193,087 tons, of which 90,669 was registered and 13,457 steam; and in 1859 to 251,001, of which 115,328 was registered and 135,778 enrolled and licensed. The shipping built in the state amounted in 1850 to 15,964 tons, and in 1859 to 7,186. The following table exhibits the progress of the commerce, navigation, &c., of the state for the 10 years ending June 30, 1859:

The domestic trade, internal and coastwise, is extensive, and constantly increasing. Baltimore is now connected by railroad with Wheeling (379 m.) and Parkersburg (388 m.), both on the Ohio; with Philadelphia (98 m.), New York (135 m.), Harrisburg (84 m.), Williamsport (178 m.), and the ports of the lakes; and with Washington (89 m.), and all the principal places of the South and South-West.—The following is a list of the railroads of this state, with their cost to 1859:

| Railroads | Length, miles | Cost |
|--|---------------|-------------|
| Annapolis and Elkridge..... | 20.5 | \$442,000 |
| Baltimore and Ohio..... | 379.6 | \$4,002,045 |
| Branches..... | 7.2 | |
| Washington Line..... | 30.8 | 1,808,000 |
| Northern Central..... | 142.8 | 4,000,487 |
| Philadelphia, Wilmington, and Balt'rs. | 85.0 | 6,354,751 |
| Port Deposit Branch..... | 6.0 | |
| Western Maryland..... | 60.0 | 730,000 |
| Coal railroads..... | 108.0 | 2,000,000 |

A large portion of these roads traverses the neighboring states; the actual length in Maryland is not more than 500 m., or about a mile of railroad to every 25 sq. m. of territory. The coal roads consist of the Cumberland (Eckhart), the Cumberland and Pennsylvania, George's Creek, and a number of others in the same neighborhood. The Chesapeake and Ohio canal follows the valley of the Potomac from Cumberland, the centre of the mining region, to Georgetown, D. C., and Alexandria, Va., and has a length of 196 m. A part of the Susquehanna and tidewater canal is within this state, and also a part of the Chesapeake and Delaware ship canal. The coasting trade employs a vast amount of tonnage, and regular steam communication is maintained with all the great Atlantic cities. Baltimore, the chief port of the state, is indeed one of the great depots of the domestic and foreign commerce of the Union. The total length of post route in the state in 1858 was 2,885 m., of which 748 m. was railroad, 429 m. coach road, and 1,658 m. other road. The number of banks in the state in Jan. 1851, was 25, and in Jan. 1860, 32. The liabilities of these institutions at the latter date was as follows: capital, \$12,560,635; circulation, \$3,213,749; deposits, \$9,486,278; profits on hand, \$930,796. Resources: notes, bills of exchange, &c., \$22,416,957; specie, \$3,294,671; real estate, \$484,625; total, \$26,196,453.—The government of Maryland is based on the constitution of July 4, 1851. Every free white male citizen of the United States, 21 years of age, who has resided in the state 1 year and in the district 6 months, is qualified to vote for all elective officers. The general election is held on the first Wednesday of November biennially. The legislature is composed of a senate of 23 members, chosen for 4 years, one half every 2d year, and a house of delegates of 74 members, renewed biennially. Members of both houses must have resided in the state 3 years, and in the district for which elected for the last year thereof; and senators must be 24, and delegates 21 years of age. The legislature meets on the first Wednesday in January every 2d year. The president of the senate and speaker of the house have each \$5 a day during the sessions. The governor of the state is chosen by a plurality of votes, and his term, commencing on the 2d Wednesday of January (even years), continues for 4 years; salary, \$3,600 per annum. He must be 30 years of age, a citizen of the United States, and have resided in the state 5, and in the district from which elected 3 years. The state is divided into 3 gubernatorial districts—

east, middle, and north; and the governor is elected from each in rotation. There is no lieutenant-governor, but in case of the governor's death or disability, the president of the senate, or failing him, the speaker of the house, succeeds to the executive, and holds office until a governor is elected by the people. The chief executive officers are appointed by the governor; these are the secretary of state, salary \$1,000; the treasurer, \$2,500; the controller, \$2,500, &c. The judiciary consists of a court of appeals with 4 judges (one of whom the governor names as chief justice), elected by the people for 10 years, or until 70 years of age; and of 8 circuit courts, each presided over by a judge who is elected for 10 years, except in the city of Baltimore, where the circuit is divided into a criminal court, a court of common pleas, and a superior court, each having one judge elected for 10 years. Beside these, there are several local courts. Each county and the city of Baltimore elect 8 persons as judges of the orphan court, to hold office for 4 years; a register of wills for 6 years; justices of the peace, 2 sheriffs, and constables, for 2 years. Attorneys of the commonwealth are chosen in each county by the people for 4 years. The revenue of the state is derived chiefly from taxation, licenses, tobacco inspections, lotteries, interest and dividends from investments, &c. The greatest portion of the income is paid out on account of the state debt and liabilities. The receipts into the treasury for the fiscal year ending Sept. 30, 1859 (exclusive of balance from previous year) were \$1,200,552.77, and the disbursements were \$1,129,869.69, including amounts paid for redemption of the state debt. The balance in the treasury, Sept. 30, 1859, was \$518,291.16. The nominal public debt at the close of the fiscal year 1859 amounted to \$14,821,473; at the close of 1855 it was \$15,132,909. The sinking fund amounted in 1859 to \$4,582,975, which consists entirely of state bonds; and the state has also property in railroads, banks, and other dividend-paying institutions, amounting to \$9,500,000. The unproductive property of the state amounts nominally to about \$14,000,000, the greater part of which will never be realized. In 1858 the assessed valuation of taxable property was \$255,447,588; on this the state direct tax is 10 cents on the \$100. The school fund amounted in 1859 to \$327,263. The principal institutions supported in part or wholly by the state are the Maryland asylum for the insane, and the state penitentiary, both at Baltimore.—The number of children returned by the census of 1850 as attending school was 62,063, or one to every 7.94 of the free population; and the state contained in that year 898 primary and public schools, with 986 teachers, 83,111 scholars, and \$218,836 annual income; 223 academies and private schools, with 503 teachers, 10,787 scholars, and \$232,341 income; and 18 universities and colleges, with 98 teachers, 1,127 students, and \$113,714 income; total, 1,184 schools, 1,587 teachers, and 45,025 schol-

ars, supported by an aggregate income of \$564,891. The number of free persons over 20 years of age who could not read and write was 41,877, of whom 20,815 were white, and 21,062 free colored persons. The principal collegiate and professional schools in the state in 1859 were Washington college at Chestertown; St. John's college at Annapolis; St. Mary's college at Baltimore; St. Charles's college at Ellicott's Mills; Mount St. Mary's college at Emmittsburg; college of St. James in Washington co.; St. John's college at Frederic City; St. Mary's theological seminary at Baltimore; Mt. St. Mary's theological seminary at Emmittsburg; novitiate of the society of Jesus at Frederic City; St. Charles seminary at Ellicott's Mills; medical department of the university of Maryland at Baltimore; Washington medical college at Baltimore; and the college of dental surgery at Baltimore. The number of churches of all denominations in 1850 was 909, with accommodations for 370,465 persons, and valued as property at \$3,947,884. Of these, 45 were Baptist, 133 Episcopal, 6 Free, 26 Friends', 22 German Reformed, 40 Lutheran, 479 Methodist, 56 Presbyterian, 65 Roman Catholic, and 37 other denominations. The Methodist churches had accommodation for 181,715, the Episcopal for 60,105, the Roman Catholic for 81,100, the Lutheran for 24,700, the Presbyterian for 22,685, the Baptist for 15,950, the German Reformed for 14,800, and the Friends' for 7,760. The number of newspapers and periodicals published in 1850 was 68, circulating annually 19,612,724 copies; of these, 6 (15,806,500 copies) were daily, 4 (499,700 copies) tri-weekly, 54 (3,166,124 copies) weekly, 1 (48,000 copies) semi-monthly, and 8 (92,400 copies) monthly; and 20 (14,654,000 copies) were literary and miscellaneous, 1 (3,400 copies) neutral and independent, 39 (4,196,924 copies) political, 6 (669,400 copies) religious, and 2 (84,000 copies) scientific. The libraries other than private numbered 124, with an aggregate of 125,042 volumes, of which 17 (54,750 vols.) were public, 8 (6,335 vols.) school, 84 (28,315 vols.) Sunday school, 10 (33,792 vols.) college, and 5 (1,850 vols.) church libraries. The whole number of paupers supported in whole or in part within the census year was 4,494, and the number receiving aid on June 1, 1850, was 2,001; cost of support for the year, \$71,668. Criminals convicted within the year, 207; in prison, June 1, 1850, 397.—The first settlement in Maryland was made by Capt. William Clayborne with a party of men from Virginia on Kent island, Chesapeake bay, in 1631. But the charter under which the colony was permanently established was granted to Cecilus Calvert, 2d Lord Baltimore, by Charles I., and was dated June 20, 1632. The province covered by this grant had been partially explored by Sir George Calvert, father of the grantee, 4 years before. It was named in the charter *Terra Maria*, "Mary's Land," in honor of Queen Henrietta Maria. The expedition designed to commence the settlement sailed from

the isle of Wight Nov. 22, 1633, in two vessels named the Ark and the Dove. The emigrants formed a body of 200 persons, and were nearly all Roman Catholics and gentlemen of fortune and respectability. They landed on St. Clement's island, March 25, 1634, and two days afterward commenced a settlement at St. Mary's on the mainland, whence they bear in our annals the title of "pilgrims of St. Mary's." Leonard Calvert, brother of the lord proprietary, who had conducted the colony from England, became its first governor. A year or two after landing he turned his attention toward Olayborne's settlement; but Clayborne refused to acknowledge himself subject to the new government, and was at length expelled along with his most active adherents. Beyond this and a few slight disturbances with the Indians, nothing occurred for some years to check the prosperity of the settlement. The first legislature met in 1639. In 1642 a company of Puritans, who had been expelled from Virginia for non-conformity, settled in Maryland, and soon began to manifest a spirit of resistance to the authority of the proprietary. Olayborne also had returned from his exile and regained possession of Kent island. The efforts of the governor to dispossess him not only failed, but Olayborne and his partisans, with the Puritan party, made themselves complete masters of the province, and compelled the governor in his turn to fly into Virginia. This event occurred in 1644. In 1646, however, the governor returned at the head of a military force and recovered possession. In 1649 the assembly passed that noble act which conferred on the colony the title of "land of the sanctuary." By this act Christians of all sects were secured in the public profession of their faith, and allowed to worship God according to the dictates of their own consciences. The Puritans, whose arrival in the colony has already been noticed, settled at Providence, which at a later period received the name of Annapolis, and became the seat of government. They still proved turbulent, and as a means of conciliating them their settlement was erected in 1650 into a separate county under the name of Anne Arundel; and still additional members of this denomination arriving from England, Charles county was organized for them a short time afterward. From this time they began to exercise a controlling influence in public affairs. On the overthrow of the royal government and the establishment of the commonwealth in England, their party insisted upon an immediate recognition of the new order of things. The authorities, however, proceeded to proclaim Charles II. But in the next assembly it was found that the Puritans had a majority; and in 1652 commissioners from England visited Maryland, with whom were associated Olayborne, the old opponent of the proprietary government, and Bennett, the leader of the Puritans of Anne Arundel county. They removed Gov. Stone, and completely established the authority of the commonwealth. Kent island was once more delivered up to Olay-

borne, and he acquired also Palmer island at the mouth of the Susquehanna. In 1654 Lord Baltimore made a determined effort to regain possession of the province, and having succeeded reinstated Gov. Stone; but Bennett and Olayborne, the former of whom was now governor of Virginia, again interfered, and reversed all that Lord Baltimore had accomplished. They established a commission for the government of the colony, and placed Capt. Fuller at its head. Hereupon a civil contest ensued, and hostilities were carried on by land and water. Providence was attacked by the proprietary party, but the Puritans were victorious, and killed or captured the whole invading force. Many of the captives, among whom was Gov. Stone, were condemned to death, and at least 4 of them were executed. This decisive action was fought March 25, 1655. Three years after, however, the power of the proprietary was restored, and his brother Philip Calvert appointed governor. In 1660, 26 years from the foundation of the colony, the population was 12,000; and in 1671 it had increased to 20,000. There were yet no considerable towns. St. Mary's contained only 50 or 60 houses, and Providence was still smaller. In 1662 the Hon. Charles Calvert, son of the lord proprietary, was appointed governor, and so continued until 1665, when on the death of his father he succeeded to his rights, and appointed Thomas Notely his representative. After the revolution of 1688 the government was assumed by King William, and in 1691 Sir Lionel Copley was sent out as governor. Among the first acts of importance under the new government was the removal of the capital to Providence, which was thenceforth known as Annapolis. In 1695 the first post route was established, and extended from the Potomac through Annapolis to Philadelphia. The mail carrier was required to traverse it 8 times a year, and for his services to receive £50 per annum. In 1714 Benedict Charles Calvert succeeded on the death of his father to his hereditary rights, and having been educated a Protestant, the principal obstacle to the recognition of the claim of this family was removed; and the next year the authority of the proprietary was restored throughout the colony after a suspension of 24 years. Hart, the last of the royal governors, was continued in office. In 1729 Baltimore was laid out. In 1745 the "Maryland Gazette," the first newspaper printed in Maryland, was established at Annapolis, and continued to be issued by the descendants of Thomas Green, its founder, until 1839. Frederic City was founded in 1745, and was so named after the son and successor of the then proprietary. Georgetown, now in the district of Columbia, was laid out in 1751, and, being at the head of the navigation of the Potomac, grew rapidly in population and trade. The population of the province in 1748 was estimated at 180,000, of whom 86,000 were blacks. Eight years later the computation was 154,188. The policy of the English government was to repress all efforts to establish

manufactures; but in 1743 there were copper works in operation, and in 1749 8 furnaces and 9 forges; and wine was produced to a considerable extent. The great staple export, however, was tobacco, of which 80,000 hogsheads were exported annually, and for many purposes tobacco was the currency of the province. In 1782 it was made a legal tender at one penny a pound. Almost from the date of the foundation of the colony disputes with the neighboring provinces regarding boundaries had been a serious cause of disquiet. These were at length decided by the appointment of Mason and Dixon in 1760 to survey the line between Pennsylvania and Maryland. (See MASON AND DIXON'S LINE.) In the long and bloody contest which annihilated the French dominion in America, Maryland bore an active part. Braddock's expedition against Fort Duquesne was organized in this province in 1754; and from this time to 1758, when the fort was finally taken, the western parts of Maryland were kept in constant terror, and large numbers sought refuge in Baltimore and other coast towns. The stamp act and the tea duty act were alike opposed by the people of Maryland, and the proprietary government was superseded by committees of public safety and conventions of the whole people. In Aug. 1776, a convention assembled, and in September presented a bill of rights and a constitution, which were adopted in November. The first elected legislature assembled at Annapolis, Feb. 5, 1777, and on the 18th Thomas Johnson was chosen the first republican governor. Throughout the war the Maryland troops were remarkably efficient, and under the title of the "Maryland line" took a high position in the continental army. They took part in the battles of Long island, Harlem heights, White Plains, Trenton, Princeton, &c.; and indeed, with the exception of the actions in the campaign against Burgoyne, there was no prominent battle of the war, from that of Brooklyn heights to Yorktown, in which the troops of Maryland did not take an honorable part. On Dec. 23, 1783, Washington resigned his commission to the congress assembled at Annapolis. Attention was now turned to the development of the resources of the state and western settlements; and at a meeting of commissioners of Virginia and Maryland appointed for this purpose in 1784, it was proposed that the two states should unite their efforts to render the Potomac navigable by means of locks and dams, and that to connect its head waters with the Ohio a road 40 m. long should be constructed. The "Potomac company" was chartered, and Gen. Washington became its first president; but though something was done toward carrying these designs into effect, their complete accomplishment was reserved for a later date. The federal constitution was adopted in the Maryland convention by a vote of 63 to 11. During the war of 1812, Admiral Cockburn, the British naval officer, committed a series of depredations on the shores of the Chesapeake bay, and plundered

and burned Frenchtown, Havre de Grace, Fredericktown, and Georgetown. The Maryland militia opposed the march of the British to Washington in 1814, but without effect. In the same year was fought the battle of North Point, in which the British general Roes was killed, and the Americans gained a slight advantage; and on the next day (Sept. 14) the invaders began an attack upon Baltimore by the bombardment of Fort McHenry. The defence was bravely conducted, and on the 16th the British fleet weighed anchor and made sail down the bay. On the return of peace the citizens once more turned their attention to the riches of the West. Experience had proved the impracticability of rendering the Potomac navigable as proposed by the company formed in 1784; and it necessarily gave place to a much greater and more expensive work. The Chesapeake and Ohio canal was suggested, and the design approved of by Maryland, Pennsylvania, and Virginia. The work was undertaken by a company formed in 1828. In the year previous measures had been taken to secure the building of a railroad from Baltimore to Cumberland. The state favored this project, and subscribed largely to its stock. Many other improvements were now projected. Railroads were undertaken from Baltimore to York, Penn.; from Baltimore to Washington, with a lateral branch to Annapolis, &c. Some of these were commenced with the aid of means furnished from the treasury, and during their construction large sums of the public moneys were advanced; such are the bases of the present public debt. All these are now completed, and paying the interest on the bonds issued in their behalf. By these the coal of Cumberland is brought to the cities of the district and to Baltimore, and distributed to the towns along their lines; the whole interior is opened to the Baltimore market; and the vast physical disabilities under which the commercial metropolis originally labored have been removed. The progress of commerce since the completion of these works is shown in a table heretofore given. In 1851 the constitution of the state was remodelled.

MARYSVILLE, the capital of Yuba co., Cal., on the N. bank of the Yuba river, 1 m. above its junction with Feather river, 100 m. N. N. E. from Benicia, and 50 m. N. from Sacramento; pop. in 1858 estimated at 8,000. In the rainy season the population is greatly increased by the influx of miners. It contains several churches, Baptist, Episcopal, Methodist, Presbyterian, and Roman Catholic. It has regular steamboat communication with San Francisco.

MASACCIO, or more properly TOMMASO GUMI, a Florentine painter, born at San Giovanni, between Florence and Arezzo, in the early part of the 15th century, died in 1443. He is said to have been a pupil of Masolino da Panicci, and from the outset of his career his neglect of all the external relations of life, in his exclusive devotion to art, procured him the name of Tommasaccio or Masaccio, which

means literally "slovenly Thomas." While a young man he appears to have visited Rome, and to have painted there in the chapel of Sta. Caterina in the church of S. Clemente a series of frescoes from the life of St. Catharine, and other subjects, which are the earliest works ascribed to him with any certainty. Time and the efforts of restorers have left few traces of Masaccio's hand in these, except the composition; but from the engravings which exist some idea can be formed of their original simplicity and beauty. The frescoes illustrating the life of St. Peter, which he painted in the Brancacci chapel of the Carmelite church in Florence, are much more important, having been the means of introducing a marked improvement in painting, and of promoting the splendid culmination of art which marked the close of the 15th century and the commencement of the 16th. The frescoes in this chapel are comprised in 12 compartments, 2 of which were painted by Masolino and 6 by Masaccio, while the remaining 4 were completed many years afterward by Filippino Lippi. Masaccio's subjects were the "Expulsion of Adam and Eve from Paradise," the "Tribute Money," "Peter raising a Youth to Life," "Peter and John healing the Cripple," "Peter and John distributing Alms," and "Peter baptizing Converts." No painter had previously infused so much individual character into his works, or so carefully studied the bodily conformation of man. Neither the representation of the event, nor the manifestation of his own feelings through the medium of forms and expressions, seems to have been the exclusive aim of the artist; but he has attempted to depict the human figure as it looks and moves, wholly regardless of any conventional type adopted by his predecessors. An illustration of this is afforded in the fresco of St. Peter baptizing the converts, in which a young man who has thrown off his garment seems to be shivering with sudden cold. The naturalness of the attitude awakened the admiration of contemporaneous artists to such a degree, that Lanzi says: "The figure formed an epoch in art." The animation and variety of character in the heads, the roundness and relief of the limbs and bodies, the draperies seemingly dependent only on the form beneath, and yet falling in grand and simple folds, and above all perhaps the powerful feeling for truth and individuality which the composition evinced, gave additional interest to these works; and for half a century after the death of Masaccio the Brancacci chapel was visited by painters as the repository of the most precious models for study. Among those who were accustomed to resort there, Vasari enumerates Leonardo da Vinci, Michel Angelo, Andrea del Sarto, Perugino, and Raphael, all of whom derived the germ of their several styles from the contemplation of Masaccio's frescoes. The superiority of Masaccio over all previous painters is attributed chiefly to his early studies in modelling, as also in chiaroscuro and perspective. He was the first who successfully fore-

shortened the extremities of his figures, and his drawing and coloring of the naked figure were only surpassed by Raphael, Titian, and a few of their contemporaries. Little is known of his easel pictures, although some fine heads are attributed to him. Several of these are in Florence; and two pictures in the Liverpool institution have been attributed to him, though Wagler denies it. Of the artist who achieved this revolution in art little else is known, save that he died suddenly and in a suspicious manner, and is buried in the Brancacci chapel. Much perplexity exists as to the date of his birth, which has been variously stated at 1401, 1402, and 1417, the first from various circumstances probably being nearest the truth, though the paucity of his works would lead one to suppose that he died young.

MASANIELLO. See ANIELLO.

MAS A TIERRA. See JUAN FERNANDEZ.

MASAYA, a town of Nicaragua, 12 m. N. W. from the city of Granada; pop. 15,000, chiefly Indians. It is in the centre of a very fertile district, and is distinguished for the general industry and thrift of its inhabitants, who are largely engaged in the manufacture of hats, saddles, hammocks, cordage, &c. The town sustained great damage from an attack by Gen. Walker in 1856, from which however it is rapidly recovering. In the vicinity is a lake of the same name, on the N. W. border of which rises the volcano of Masaya. The latter is a broad, low mountain, not more than 8,500 feet in height, with one large and several minor craters. It was in active eruption at the time of the conquest in 1527, when it was known as one of the wonders of the new world, under the designation of *El Inferno de Masaya*, or the Hell of Masaya. Vast lava beds, some of very ancient and others of comparatively later date, cover the country around it for many miles in every direction, and attest its fearful activity in times past. Its last eruption was in 1870, when it sent out a vast flood of lava, which flowed down in the direction of Lake Managua for a distance of more than 20 miles. This great lava field resembles an ocean of ink suddenly congealed in a storm. During the past 8 years the volcano, after a long period of repose, has exhibited signs of renewed activity, and now (1880) sends out great volumes of smoke, which at night are illuminated from below with a lurid glare like that of a furnace. Serious fears are entertained of an eruption.

MASOAGNI, PAOLO, an Italian anatomist, born at Castelleto, near Sienna, in 1752, died in Florence, Oct. 19, 1815. He became professor of anatomy at the university of Sienna in 1774, and in 1784 obtained a prize from the French academy of sciences for his *Prodrome d'un ouvrage sur le système des vaisseaux lymphatiques*. In 1787 appeared his most important work, *Vasorum Lymphaticorum Corporis Humani Historia et Iconographia*. After officiating for a short time at the university of Pisa, he was attached from 1801 till his death to the hospital of Santa Maria at Florence as

professor of anatomy, physiology, and chemistry. His posthumous works are: *Anatomia per uso degli studiosi di scultura e pittura* (Florence, 1816), and *Anatomia universale*, with illustrations (Pisa, 1828-'31).

MASÈRES, FRANÇOIS, commonly called Baron Masères, an English mathematician, born in London, Dec. 15, 1781, died at Reigate, May 19, 1824. His grandfather, exiled from France by the revocation of the edict of Nantes, went to England with William of Orange. He was educated at Cambridge, attained the first place both in the classics and mathematics, studied law, and after a few years' practice was appointed attorney-general for Canada, and resided in Quebec till 1778. After his return to England he recommended conciliatory measures with the American colonies, and was appointed to the sinecure office of cursor baron of the exchequer, which he held during the remainder of his life. He matured a plan for securing small pensions from government to such of the poorer classes as should make certain contributions while having health and vigor. It was embodied in a bill, which passed the commons, but was lost in the house of lords through the influence of the bishops. Baron Masères made valuable contributions to science, not only by his own writings but by his munificence in publishing the works of others. When a young man (1758) he wrote a treatise against the abuse of the negative sign in algebra, which he regarded as the principal cause of the incorrect and vague language then prevalent among algebraists. He also wrote on the "Elements of Plane Trigonometry" (1750), a learned treatise on "Life Annuities" (1783), and numerous papers in the "Philosophical Transactions," all of which are extremely prolix on account of his rejection of algebraic formulas. He published a collection of the principal writings on logarithms, under the title of *Scriptores Logarithmici* (6 vols., 1791-1807), in which he interspersed many original tracts; and a similar collection of works on optics, entitled *Scriptores Optici* (1823).

MASHAM, ABIGAIL, lady, an Englishwoman of much political influence in the reign of Queen Anne, born about the year 1670, died Dec. 6, 1784. The place of her birth is not known, but probably it was London, where her father, Francis Hill, was a Turkey merchant. Mr. Hill is said by the duchess of Marlborough to have been a connection of Robert Harley, afterward earl of Oxford. He married a sister of the duchess, a Miss Jennings, and was of good station until he ruined himself by becoming a "projector," or speculator. Abigail, his eldest daughter, then became a waiting woman to the wife of Sir John Rivers, a Kentish baronet. When Lady Marlborough came to a knowledge of the poverty of her relatives, the Hills, she afforded them great assistance. Money was given to Mrs. Hill; her daughter Mary was made laundress to the duke of Gloucester, son of the princess Anne; one of her sons was

placed in the customs, and another made a page to the prince of Denmark; and Abigail was appointed bedchamber woman to the princess. Many other favors were conferred upon the Hills by the Churchills; but the arrogance of Lady Marlborough was so great that she probably offended all the recipients of her bounty, and prepared the way for an apparent act of signal ingratitude, which potently affected the history of Europe. Availing herself of her confidential position in the service of Anne, who had become queen, Abigail Hill was steadily undermining the duchess of Marlborough at court, an undertaking which she found all the more easy because of the queen's hatred of the duchess. Samuel Masham, a gentleman of the bedchamber to the prince of Denmark, became attached to Abigail, and the queen was the confidant of their courtship, of which the Marlboroughs knew nothing. Harley was another confidant. Anne was present at their marriage, which took place in 1707. The Marlboroughs were astonished. After a long and bitter struggle, the Marlborough influence was overthrown, the whig ministry was dismissed, and the tories came into power, made the treaty of Utrecht with Louis XIV., and put an end to that brilliant war which had reduced France to the lowest point of distress, and which, had it been continued, must have brought the Bourbon rule of the Spanish empire to a rapid end. All this was the work of Mrs. Masham, without whose influence over the queen's mind the war party could not have been broken down. At the close of 1711 Mr. Masham was made Baron Masham of Otes, being one of the 13 peers created to enable the tory ministers to force their measures through the house of lords. He was of higher family than his wife, being a younger son of Sir Francis Masham, descended from George, duke of Clarence, brother of Edward IV., and a distant relative of the Cromwell family. He was a general, and held several offices at the court and sinecure appointments. In the quarrel that took place between Oxford and Bolingbroke, Lady Masham sided with the latter, and was as bitter an enemy of that relative as of the Marlboroughs. On the death of Queen Anne in 1714, her court favor came to an end, as the whigs came into power on the accession of George I., and she and her husband retired to their seat at Otes. Lady Masham's character has been drawn by partisans only, and it is difficult to arrive at a correct conclusion respecting it; but it is not possible that a dull illiterate woman, as she has been represented to be, could have played the important part that fell to her lot, and which was very successful against powerful factions, interests, and individuals.

MASINISSA, or MASSINISSA, a king of Numidia, born about 240, died in 148 B. C. He was the son of Gala, king of the Massylians, the most powerful tribe in E. Numidia, and received a superior education at Carthage, which when he reached the age of manhood commen-

ced its second great struggle against Rome, under the lead of Hannibal. The diplomacy of Hasdrubal, the son of Gisco, who promised the hand of his beautiful daughter Sophonisba to the young prince, prevailed on the king of the Massylians to conclude an alliance with Carthage, and to declare war against Syphax, king of the Massylians, a rival Numidian tribe, who had espoused the cause of the Romans. Masinissa commanded his father's army, routed Syphax (218), and subsequently crossed over to Spain, where he gallantly fought with the Carthaginian generals, the Numidian horse greatly contributing to the final defeat of the brothers Oneius and Publius Scipio, until the arrival of the son of Publius, afterward known as Scipio Africanus the elder, suddenly turned the scale of fortune. Scipio was no less able as a diplomatist than as a general, and his timely return of Massiva, the captive nephew of the Numidian, to his uncle with presents and a courteous message, paved the way for a secret understanding with the latter, which proved disastrous to Carthage when Scipio finally carried the war into Africa. Another and perhaps more powerful reason for Masinissa's defection was the circumstance that Hasdrubal, in order to gain over Syphax, broke his promise and married Sophonisba to the latter. Returning to Africa, where his father and elder brother had in the mean while died, Masinissa reconquered his kingdom from a usurper, but was soon attacked by the betrayed Carthaginians and their new ally, was repeatedly routed, and saved his life by flight. At this juncture Scipio landed in Africa (204), and Masinissa was enabled not only to regain his possessions, but while assisting his victorious allies, jointly with Lælius, one of their commanders, took Cirta, the capital of his rival Syphax. Sophonisba became his captive, and soon his wife. But afraid of the influence of Hasdrubal's daughter, whose patriotism equalled her charms, over her new consort, Scipio severely reprimanded Masinissa, and asked the surrender of the Carthaginian woman as a captive of Rome. Unable or unwilling, at the risk of his power, to defend the freedom of his wife, Masinissa saved her from the ignominy of Roman captivity by sending her a cup of poison, which she drank without hesitation. Syphax was sent to Italy, where he shortly after died. In spite of his tragic loss, Masinissa from ambition persisted in his fidelity to Rome, and his aid contributed not a little to the issue of the terrible battle of Zama (202), in which he commanded the cavalry on the right wing of Scipio's army, and which terminated with the rout of Hannibal. Peace was concluded soon after (201), and Masinissa was rewarded by the victors with a part of the territories of Syphax. He now reigned in peace for 50 years, developing the resources of his kingdom by the promotion of agriculture, and extending its limits by annexations from the possessions of Carthage, which were approved of by the partial senate of Rome, and in consequence of which a few

years before his death he entered once more the field of battle. Scipio Africanus the younger from a hill witnessed the last victory of the Numidian, who, though above 90 years of age, not only possessed all his pristine energy, but also mounted his horse with the agility of a youth. His defeat of the Carthaginians made it easier for the Romans subsequently to conquer them; and the last Punic war commenced soon after, in the second year of which Masinissa died, leaving his possessions to be divided by his friend Scipio among his 3 legitimate sons Micipsa, Gulussa, and Mastanabal, with rich donations to their very numerous illegitimate brothers.

MASK, IRON. See BASTILE.

MASKELYNE, NEVIL, an English astronomer, born in London, Oct. 6, 1732, died in Greenwich, Feb. 9, 1811. He was graduated at Cambridge in 1754, was admitted to orders, officiated for some time as curate, and obtained a fellowship in 1756. In 1758 he became a fellow of the royal society and a contributor to its "Philosophical Transactions" on astronomical subjects. He was sent by that body to St. Helena in 1761, to observe the transit of Venus. Soon after returning he was placed as chaplain on board the Princess Louisa, in order that he might proceed to Barbados, and test the merits of Harrison's new chronometers and Irvine's marine chair. In 1765 he succeeded Mr. Bliss as astronomer royal at Greenwich. He superintended the "Nautical Almanac," established at his suggestion, from 1767 till his death. He was the first to publish what is termed "a standard catalogue of stars," and Delambre dates the commencement of accurate astronomical observation from his installation at Greenwich.

MASON. I. A W. co. of Va., bounded N. and W. by the Ohio river, and drained by the Great Kanawha and its tributaries; area, 800 sq. m.; pop. in 1850, 7,589, of whom 647 were slaves. It has a diversified surface and fertile soil, and contains iron ore, coal, and valuable salt springs. The productions in 1850 were 20,545 bushels of wheat, 899,080 of Indian corn, 11,100 lbs. of tobacco, and 28,607 of wool. There were 7 grist mills, 4 saw mills, 4 tanneries, 12 churches, and 1,150 pupils attending public schools. Value of real estate in 1856, \$2,758,827; increase since 1850, 51 per cent. Capital, Point Pleasant. II. A N. E. co. of Ky., bordering on the Ohio river, intersected by the N. fork of Licking river, and drained by Limestone and Lee's creeks; area, 286 sq. m.; pop. in 1850, 18,844, of whom 4,284 were slaves. The surface is diversified, hilly toward the N., and the soil fertile. The productions in 1850 were 978,470 bushels of Indian corn, 50,286 of oats, 2,492,622 lbs. of tobacco, 47,140 of wool, and 1,853 tons of hemp. There were 87 grist mills, 11 saw mills, 2 woollen factories, 7 tanneries, 35 churches, and 542 pupils attending public schools. Capital, Washington. III. A W. co. of Mich. (formerly Notipeskago), bordering

on Lake Michigan, and drained by the Notipeskago, Marquette, and Great and Little Sable; area, 480 sq. m.; pop. in 1850, 98. Its surface is generally level and the soil fertile. IV. A central co. of Ill., bounded N. W. by the Illinois and S. by the Sangamon; area, 580 sq. m.; pop. in 1855, 7,775. The surface is low, and the soil, which is mostly prairie, very fertile. The productions in 1850 were 142,474 bushels of wheat, 555,610 of Indian corn, 70,400 of oats, and 10,284 lbs. of wool. Capital, Havana.

MASON, the name of a distinguished family in Virginia. The first of the family who came to North America was Col. GEORGE MASON, a member of the English parliament in the reign of Charles I. Though he opposed with great eloquence the arbitrary policy of the king, he also resisted the extreme measures resorted to against him, and subsequently became an officer in the army of Charles II. When the royalist army was defeated at Worcester by Cromwell in 1651, he made his escape disguised as a peasant, and embarking for America landed at Norfolk, Va. He lost all his possessions in England. His great-grandson, of the same name, married, about 1726, Anne Thomson, a favorite niece of Sir William Temple, and had by her two sons and a daughter. I. GEORGE, eldest son of George and Anne Thomson, born at Doeg's Neck, then in Stafford, now in Fairfax co., Va., in 1726, died in the autumn of 1792. He married Ann Eilbeck of Charles co., Md., and after his marriage built Gunston hall, on the banks of the Potomac, in which he resided till his death. In 1769 he drew up the non-importation resolutions which were presented by Washington in the assembly of Virginia, and unanimously adopted. These resolutions included one not to import or purchase any imported slaves after the first day of November. Mr. Mason was not at that time a member of the house. In 1775 the convention of Virginia desired to elect him a delegate to congress. The acceptance of the office was urged upon him in the warmest manner by Jefferson, Patrick Henry, and other leading members, and by the president of the convention, Peyton Randolph, who wept while Mason was making his speech of declination. The cause of his refusal to serve was the recent death of his wife, leaving a large family of children. He nominated in place of himself Col. Francis Lightfoot Lee, who was elected. The convention then made him a member of the committee of safety charged with the executive government of the colony, and this post he reluctantly accepted. In 1776 he drafted the declaration of rights and the constitution of Virginia, which were adopted by a unanimous vote. He was at this time 50 years of age, and is described as of commanding presence and lofty bearing, his stature nearly 6 feet, his frame athletic and robust, his complexion swarthy, his black hair sprinkled with gray, and his face grave, with radiant dark eyes. Mr. Madison pronounced him the ablest man in debate that he had ever seen. His talents for

discussion, as well as his liberal spirit, were eminently displayed in the warm debates which sprung up in the first legislature under the new constitution, about a measure which he brought forward and carried through in conjunction with Jefferson, for the repeal of all the old disabling acts, and for legalizing all modes of worship, releasing dissenters from parish rates, and suspending their collection until the next session, a suspension made perpetual 8 years later. The assembly appointed him, with Jefferson, Pendleton, Wythe, and F. L. Lee, a committee to revise the laws; but he declined to accept the appointment. In 1777 he was elected a member of the continental congress. Ten years later he was a member of the federal convention to frame the constitution of the United States. He took a leading part in the debates of this distinguished body, and always on the liberal and democratic side. In the discussion on the question whether the house of representatives should be chosen directly by the people, he maintained that no republican government could stand without popular confidence, and that confidence could only be secured by giving to the people the election of one branch of the legislature. He favored the election of the president directly by the people and for a term of 7 years, with ineligibility afterward. The attempt to secure for the national legislature a veto upon all state laws was opposed by him, and also the propositions to make slaves equal to freemen as a basis for representation, and to require a property qualification from voters. He spoke with great energy against the clause in the constitution which prohibited the abolition of the slave trade till 1808, declaring that slavery was a source of national weakness and demoralization, and it was therefore essential that the general government should have power to prevent its increase. In some of his attempts to render the constitution more democratic Mr. Mason was defeated in the convention; and when the instrument was completed he declined to sign it, declaring his apprehensions that it would result in a monarchy or a tyrannical aristocracy. He was especially dissatisfied with the extended and indefinite powers conferred on congress and the executive. Returning to Virginia, he was chosen a member of the convention called to ratify or reject the federal constitution, and in conjunction with Patrick Henry he led the opposition to the constitution in that body, insisting at least on its ratification subject to certain amendments; and in this form only could the ratification be carried. The amendments proposed by him were a bill of rights and some 20 alterations in the body of the constitution, several of which were afterward adopted by congress and the states. Mr. Mason was elected the first U. S. senator from Virginia under the constitution, but he declined to accept the office. He lived for 8 years longer in retirement at Gunston hall, devoting his leisure to study and amusing himself with hunting and fishing, of which he was extremely fond.

He held at his death the first rank among the great men of Virginia. Jefferson says of him: "He was a man of the first order of wisdom, of expansive mind, profound judgment, cogent in argument, learned in the lore of our former constitution, and earnest for the republican change on democratic principles." His statue stands with those of Jefferson, Henry, and other illustrious Virginians, at the base of Crawford's colossal statue of Washington in front of the capitol at Richmond. II. THOMSON, younger brother of the preceding, born in 1780, died in 1785. He studied law in the Temple at London, and became one of the most eminent jurists of his day. He was no less ardent in his patriotism and love of republican institutions than his brother. He took strong ground against the aggressions of the British government, and as early as 1774 published a series of masterly papers in which he maintained the duty of open resistance to the mother country. The first numbers of these papers appeared under the signature of a "British American," but in the concluding one he made known his real name with a degree of courage and beauty of style not surpassed by the declaration of independence itself. In 1778 he was appointed a member of the first supreme court of Virginia, but did not long act as such. He with his brother was nominated by the senate one of the revisers of the laws of Virginia. In 1779 he was elected a member of the house of delegates for Elizabeth City county; but having after his election changed his residence to another county, he sent in his resignation. The house, however, would not accept it. He was again a member in 1788, and served as chairman of the committee on courts of justice. III. STEVENS THOMSON, eldest son of the preceding, born in Stafford, Va., in 1760, died in Philadelphia in 1808. At the age of 20 he reached the rank of colonel in the revolutionary army, and served with distinction at the close of the war. He was a conspicuous member of the Virginia convention in 1788, and was a member of the U. S. senate from 1794 until his death. He was possessed of great powers of oratory, wit, and sarcasm, and enjoyed great personal popularity. IV. JOHN THOMSON, brother of the preceding, born in Stafford in 1764, died in Dec. 1824. He adopted the profession of the law, and in early life emigrated to Maryland, where he attained the first rank in his profession. The appointment of attorney-general of the United States was tendered to him by Mr. Jefferson (of whom he was a warm supporter and devoted personal friend), and in 1806, by the state of Maryland, the offices of chief justice and attorney-general, all of which he declined, or filled but for a brief period. In 1811, upon the resignation of Mr. Rodney as attorney-general, President Madison offered the place to Mr. Mason, but he declined it. In 1816 he was the democratic candidate for U. S. senator against Robert G. Harper; and although the legislature was largely federal, he lost the election by only a single vote. V. JOHN THOMSON, son of the preceding, born in Washing-

ton co., Md., in 1815. He was bred to the bar, and early in life was elected to the Maryland legislature, where he served for several years. Afterward, and before he had attained the age of 26, he was elected a member of congress, and was the youngest member of that body. In 1851 he was elected a member of the court of appeals of Maryland. After serving a number of years he resigned, and was appointed by President Buchanan collector of the port of Baltimore, which position he still fills. VI. ARMISTEAD THOMSON, son of S. T. Mason, born in Loudon co., Va., in 1787, killed Feb. 5, 1819. He served with distinction during the second war with Great Britain as colonel of a regiment of horse, and was subsequently a brigadier-general of the Virginia militia. He had been a member of the Virginia legislature, and in 1815 was elected to the U. S. senate, where he served till 1817, when he resigned, at the instance of his friends, to run for the house of representatives in the strong federal district of London. It was supposed that he alone, on account of his great personal popularity, could break down the federal champion of that district, Charles Fenton Mercer, and hence he made the sacrifice of resigning an office of greater dignity to run for one of lesser. He was defeated by a small majority. The contest was one of great personal bitterness, and resulted in a number of duels; among them was the famous conflict in which he himself was involved with his cousin Col. John Mason McCarty, and which ended his brilliant career at the age of 32. They fought with muskets near Bladensburg, and upon the first fire he fell mortally wounded, and died before he was removed from the field. He left an only child, Stevens Thomson, who subsequently volunteered in the Mexican war, and as a captain of the mounted rifles fell, mortally wounded, while making a gallant charge upon the enemy at Cerro Gordo. VII. RICHARD B., grandson of Col. George Mason, an officer of the U. S. army, died at Jefferson barracks in 1850. He served for a time as colonel of dragoons, but was breveted brigadier-general in 1848 for "meritorious and distinguished" services in the Mexican war. He was the first civil and military governor of California. VIII. JAMES MURRAY, also a grandson of Col. George Mason, born on Analoston island, Fairfax co., Va., in 1797. He early settled in Winchester, Va., as a lawyer. For several years he was a member of the legislature, and in 1837 was elected to the U. S. house of representatives. For the last 14 years he has been a leading member of the U. S. senate from Virginia, and has been the chairman of the committee on foreign affairs for several years past. IX. STEVENS THOMSON, grandson of Stevens Thomson Mason, already mentioned, born in Loudon co., Va., in 1811, died in New York in Jan. 1843. His father, John T. Mason, removed to Kentucky, where the son was educated. In 1831 he was appointed by President Jackson secretary of the territory of Michigan, and in that capacity, upon the translation of

Gen. Cass, the governor, to the war department at Washington, he became the acting governor. It was during this period that the celebrated controversy commenced between Ohio and Michigan in regard to their boundary line. It excited the most intense interest and bitter feeling, and thousands of troops were marched to the line with the prospect of a sanguinary conflict. Gov. Mason, through the whole controversy, until its final settlement, distinguished himself, though but a mere youth, by the calmness, ability, and courage with which he maintained the rights of Michigan. When Michigan became a state in 1835, Stevens Thomson Mason (then but 28 years of age) was unanimously elected her first governor, and was reelected for a second term. Upon retiring from office in 1839, he withdrew from political life, and removed to New York, where he entered on the practice of the law. X. JOHN Y., descended more remotely from the same stock as the above, born in Virginia about 1796, died in Paris, Oct. 4, 1859. He filled several positions of honor under the state government of Virginia, and was a representative in congress from 1831 to 1837, when he was appointed judge of the U. S. court for Virginia. He was secretary of the navy under President Tyler, and successively attorney-general and secretary of the navy under President Polk. By President Pierce he was appointed minister to France, where he continued until his death.

MASON, JEREMIAH, an American lawyer and statesman, born in Lebanon, Conn., April 27, 1768, died in Boston, Oct. 14, 1848. His father, Col. Jeremiah Mason, was an officer in the revolutionary army, and, among other services, commanded a company of minute men at the siege of Boston. He was graduated at Yale college in 1788, was admitted to the bar in June, 1791, and opened an office at Westmoreland, N. H. His practice soon became considerable, and in the autumn of 1794 he removed to Walpole, where he became, acquainted with Joseph Dennie and with William Coleman, editor of the New York "Evening Post." In the summer of 1797 he removed to Portsmouth, N. H., and soon became engaged in very extensive practice. In 1802 he was appointed attorney-general of New Hampshire. The late Jeremiah Smith was then at the bar, and he and Mr. Mason were constantly retained as opposing counsel; and he had also the opportunity of trying his powers with such antagonists as Samuel Dexter, Theophilus Parsons, and Joseph Story. In 1807 Mr. Webster removed to Portsmouth, and from that time he and Mr. Mason were on opposite sides in most of the important cases tried in New Hampshire; a fact which did not prevent the formation and growth of an intimate and affectionate friendship between them, which continued as long as they both lived. In politics he was always an earnest federalist; and though he never courted public office, and was exclusively devoted to his profession, yet such was the confidence reposed in his

abilities and his wisdom that in 1813 he was chosen to the U. S. senate, and took his seat in June of that year. He immediately assumed a leading part in the debates of that body on the exciting subjects connected with the war of 1812. He was with difficulty induced to prepare any of his speeches for the press, and the general reports were at that time imperfect. Those most fully written out by him were one on the embargo delivered in Feb. 1814, and another on the conscription bill delivered in Dec. 1815. Mr. Mason had no political ambition, and no taste for public life; and in 1817 he resigned his seat in the senate, and resumed the practice of his profession. He was afterward for several sessions a member of the legislature of New Hampshire, in which he took a leading share in the revision of the state code of legislation. He drafted the resolutions and report of the legislature on the Virginia resolutions touching the Missouri compromise. In the summer of 1832 he removed to Boston, being then 64 years old, and continued to practise in the courts till he entered his 70th year. He then retired from them, in accordance with a resolution formed long before, but still continued to be consulted as chamber counsel. Until within 4 days of his death he was apparently in vigorous health, and with mental powers unimpaired.—Mr. Mason was known to the public almost entirely as a lawyer; few men in our country of such commanding powers have confined themselves so exclusively to their profession. As a lawyer he had no superior and few equals among his contemporaries. He may have been excelled by such men as Chief Justice Parsons, Judge Story, or Mr. Webster in some particular faculty or power; but in the aggregation of accomplishments and gifts which make up the finished lawyer, he stood unrivalled and supreme upon the soil of New England. His learning was profound, various, and ready; his practical sagacity was never at fault; his presence of mind never forsook him; his judgment in the conduct of causes was unerring; and both in the examination and cross-examination of witnesses he was proverbially masterly. In the preparation of his cases he was indefatigable. He was not only a great lawyer himself, but he made good lawyers of those who were in the habit of practising with him, as associates or opponents. The thorough preparation which he enforced in all who ventured to cope with him was in itself a good professional training. He took no pains to acquire the renown of a great advocate; his genius disdained the artificial graces of rhetoric; but he always commanded the unbroken attention of the jury by his powerful logic, his lucid narrative, his acute penetration, and his skill in grouping and presenting the facts on which his cause rested. In this portion of his professional duties he was aided by his striking and commanding personal appearance; his stature, in his prime, reaching to the height of 6 feet 7 inches. But it would be doing Mr. Mason much injustice to represent him merely as a great lawyer. He

was a man of very large natural capacity, whom taste and temperament had confined within the limits of a profession. No one could converse with him, especially in his later years, without being struck with his penetrating sagacity and his ripe wisdom. His temperament was calm, tolerant, and genial. In his declining years he gladly encouraged the visits of promising young men, and acted upon Dr. Johnson's advice to keep his friendships in repair. He was a decided and practical believer in the gospel of Christ, and uniform in his observance of the ministrations of the church. He married in Nov. 1799, Mary, daughter of Col. David Means, of Amherst, N. H., and had a numerous family.

MASON, JOHN, major of the forces of Connecticut colony, and one of its early settlers, born in England in 1600, died in Norwich, Conn., in 1672. He received his military training in the Netherlands as a volunteer under Sir Thomas Fairfax, and about 1631-'2 emigrated to Dorchester, Mass., whence in 1635 he removed with a portion of the Dorchester company to Connecticut, and aided in founding the town of Windsor, on the Connecticut river. From the moment of their arrival the settlers were in constant dread of the Pequots, the most numerous and warlike tribe in New England, who inhabited a tract of country lying between the Pequot river, now called the Thames, and the territories of the Narragansets in Rhode Island. The slaughter of a party of whites at the neighboring settlement of Wethersfield in April, 1637, at length called for retaliatory measures; and at a general court convened at Hartford, Mason was commissioned, with a force of 90 men, to descend the Connecticut and attack the Pequots at the mouth of the Pequot river. Accompanied by 70 friendly Indians of the Mohegan tribe, under their sachem, Uncas, he reached the English fort at Saybrook, at the mouth of the Connecticut, in the middle of May, and thence, in opposition to the advice of his officers and to the directions of the general court, put off into Long Island sound, intending to follow the coast to the country of the Narragansets, and thence by a retrograde march along the shore fall upon his enemies unawares. On the 23d he effected a landing in Narraganset bay, near Point Judith, secured the coöperation of 200 Narraganset warriors, and having sent back his boats to meet him at the mouth of the Pequot, proceeded by quick marches to the Mystic river, the boundary line of the present towns of Groton and Stonington, in the neighborhood of which were the two principal forts of the Pequots. Although his Indian allies were now swelled in numbers to about 500, such was the terror with which the name of the Pequots inspired them that Mason was compelled to commence the attack almost unaided. About an hour before daybreak on the 26th he surprised the nearest fort, and, gaining an entrance within the palisades, fell sword in hand upon the enemy. But finding that it would prove a long and wearisome task to dis-

lodge the Indians, he set fire to their wigwams, which were soon wrapped in flames, the whites and their allies forming a circle around the fort to prevent the escape of the besieged. Between 600 and 700 Pequots perished in the conflagration or by the hands of their adversaries, 7 were captured, and 7 escaped. Of the English, 2 were killed and 20 wounded. The little band then took up their march to the mouth of the Pequot river, into which, to their great joy, they saw their vessels sail soon after. They were attacked on the way by 800 Indians from the other fort, who however soon retired. Mason, putting his wounded aboard the vessels, marched with a small party by land to Saybrook, where he was received "by Lieut. Gardiner with many great guns." A general rejoicing filled the colony; and for the purpose of following up the blow thus struck, Mason, aided by a party from Massachusetts, pursued the remnant of the Pequots, who had fled with their chief sachem, Sassacus, toward New York, killed and captured many more, and divided the few who remained in Connecticut between the Mohegans and Narragansets, stipulating that the very name of Pequot should become extinct. By these prompt measures a handful of whites was enabled within a few weeks to annihilate a powerful native tribe, and to secure a general peace with the Indians, which remained for 40 years unbroken. Subsequently Mason was appointed major of the colonial forces, which office he filled more than 30 years, and between 1660 and 1670 he was deputy governor of Connecticut. He was also for many years a magistrate. About 1647 he took up his residence in Saybrook, and thence removed in 1659 to Norwich, where he passed the remainder of his life. At the request of the general court of Connecticut, he prepared a brief account of the Pequot war, published by Increase Mather in 1677, and republished, with an introduction and notes by the Rev. Thomas Prince, at Boston, in 1736.—See his biography, by George E. Ellis, in "Sparks's American Biography," 2d series, vol. iii.

MASON, JOHN MITCHELL, D.D., an American divine, born in New York, March 19, 1770, died there, Dec. 26, 1829. His father was of Scotch birth, and pastor of an Associate Reformed church (a denomination formed by the union of two branches of seceders from the Scotch Presbyterian church) in New York. He was graduated at Columbia college in 1789, and after studying theology under his father's care for one year repaired in 1791 to the university of Edinburgh. He was there prominent especially as a speaker in the weekly meetings of the theological society, but was recalled in 1792 by intelligence of his father's death, and by an invitation to become his successor in his pastoral charge. He was installed in this office in 1798, and retained it for 17 years. His advocacy of frequent communion soon gave him prominence in the religious world. He published a pamphlet consisting of "Letters" on

this subject, which was widely distributed, and was generally effectual in inducing the Associate Reformed churches to relinquish their former practice of celebrating the communion but once or twice a year. He projected the plan of a theological seminary to be under the authority of his denomination, and again visited Great Britain for the purpose of obtaining contributions; and his pulpit efforts abroad gave him repute as one of the first preachers of the time. His plan was carried into effect, the seminary being established in New York city in 1804, and he was appointed its first professor of theology. In 1806 he projected the "Christian's Magazine," which he conducted for several years, and in which he carried on a controversy with Bishop Hobart. In 1810 he resigned his pastoral charge with the purpose of forming a new congregation. He preached during an interval in a Presbyterian church edifice, and established more intimate relations between his own and the Presbyterian congregation than were believed by some to be authorized by the constitution of the Associate Reformed church. The matter was brought before the synod in Philadelphia in 1811; and though a conciliatory resolution was passed, it was the occasion of Dr. Mason's "Plea for Sacramental Communion on Catholic Principles" (1816). While fulfilling the duties of pastor and professor, he accepted in 1811 the additional office of provost of Columbia college, and by his talents and energy raised that institution to a higher character than it had ever before possessed. To restore his health, impaired by excessive labor, he resigned this position in 1816, and made his third visit to Europe, travelling in England, France, Switzerland, and Italy. On his return in 1817 he resumed his pastoral charge, but it soon appeared that his constitution was fatally undermined, and his mental powers began gradually to decay. In 1821 he exchanged his pastorate for the presidency of Dickinson college, Carlisle, Penn.; but his health was inadequate even for the lighter duties of this position, and in 1824 he relinquished it and returned to New York to pass the remainder of his life in retirement among his friends. He had in 1822 been one of those who transferred their connection from the Associate Reformed to the Presbyterian church. His published discourses convey but an imperfect idea of the powerful eloquence for which he was celebrated. A collection of his works, consisting chiefly of sermons and orations, was edited by his son, the Rev. Ebenezer Mason (4 vols., New York, 1832; new ed., with additions, 1849).

MASON, LOWELL, Mus. Doc., an American musical teacher and composer, born in Medfield, Mass., Jan. 8, 1792. From childhood he manifested great fondness for music, and at a very early age he commenced teaching it. In 1812 he removed to Savannah, Ga., where, in connection with other pursuits, he devoted much time to giving instruction and leading choirs and musical associations. In 1821, the "Boston

Handel and Haydn Collection of Church Music," his first essay in the compilation of church music, was published; and its success led to overtures to him to remove to Boston. The proposal was accepted; and in 1827 he left Savannah, and commenced in Boston the instruction of classes in vocal music, devoting special attention to the training of children to the performance of the alto part in choral music, and to the introduction of vocal music into the public schools. About 1828 Mr. William O. Woodbridge called his attention to the Pestalozzian method of teaching music, and especially to the various improvements upon it; and after due examination he became a champion of the new method. Juvenile classes were now established and taught gratuitously by Mr. Mason, who was soon compelled by the extent of his labors to associate Mr. G. J. Webb with him. Under his influence vocal music received a new and extraordinary impulse in Boston, and indeed throughout New England; eminent teachers introduced it into their schools; the Boston academy of music was established; music was prescribed as a regular branch of instruction in the public schools of Boston, and subsequently very generally throughout New England and the middle states; permanent musical classes, lectures on music, concerts, schools for instrumental music, and "teachers' institutes" for the training of music teachers and leaders of choirs, were very generally established. In 1837 Mr. Mason visited Europe, and made himself acquainted with all the improvements in musical teaching in the continental cities. Since his return, in addition to his large contributions to musical literature and the preparation of numerous text books for juvenile classes, glee books, and collections of church music, he has taught and lectured at the teachers' institutes in Massachusetts, and has instructed classes of music teachers almost every autumn. In 1855 he received from the New York university the degree of doctor in music, the first instance of the conferring of such a degree by an American college. Of late years he has devoted much attention to congregational singing in churches. Dr. Mason has been the author and compiler of more musical works than any other writer in America. For many years he has been a frequent contributor to the "Musical Review" and other periodicals; he has published 15 or 16 juvenile collections of music, 7 or 8 glee books, mostly in connection with Mr. G. J. Webb, and 20 sacred and church music books, assisted in 8 of them by Mr. Webb. Beside these, he has also published several smaller works, and a large number of single pieces. In all these books are many pieces of his own composition, and many more adapted by him from the compositions of other authors.

MASON, WILLIAM, an English poet and clergyman, born in Hull in 1725, died in York in April, 1797. He was the son of a clergyman, was educated at the university of Cambridge, and became a fellow in 1747. His prin-

dipal works are a descriptive poem called "The English Garden," and two tragedies, "Elfrida" and "Caractacus." He was also the author of "An Historical and Critical Essay on English Church Music." He was an intimate friend and imitator of Gray, and published an edition of his poems with a memoir of his life.

MASON AND DIXON'S LINE, the parallel of lat. $39^{\circ} 43' 26.8''$ N., which separates Pennsylvania from Maryland, drawn by Charles Mason and Jeremiah Dixon, two distinguished English mathematicians and astronomers. It forms the dividing line between the free and slave states of the original confederation. This celebrated line properly begins at the N. E. corner of Maryland, and runs due W. The years from 1681 to 1768 were marked with constant dissension and conflict between the rival proprietaries of Pennsylvania and Maryland and their partisans, upon the subject of their common boundary; and the vicinity of this line was the theatre of riot, invasion, and bloodshed. The first English colonies were settled under a grant from King James I. in 1606, which gave to 2 incorporated companies 11° of latitude on the Atlantic, reaching from lat. 34° to 45° N., the whole territory having the common name of Virginia. The North Virginia or Plymouth company possessed the N.; the S. portion of the territory was held by the London company. Lat. 40° N. separated these two colonies. The northern was called New England by Capt. John Smith in 1614, while the southern retained exclusively the name of Virginia. In 1624 the influence of Gondemar, the Spanish minister, together with his own dislike of popular freedom, induced King James to revoke the charter of both. The unsettled wastes of their territories were now subject anew to the royal grant. In 1629 George Calvert, Lord Baltimore, besought the king for a charter of lands in this region, but died before it was perfected. His son and successor, Cecilus Calvert, subsequently obtained from Charles I. (June 20, 1632) a grant which he named Maryland, after the queen Henrietta Maria. It conveyed to him "all that part of the peninsula or chersonese lying in the parts of America, between the ocean on the east and the bay of Chesapeake on the west, divided from the residue thereof by a right line drawn from the promontory or headland called Watkins point, situated upon the bay aforesaid, and near the river of Wighco on the west, unto the ocean on the east; and between that boundary on the south, and that part of the bay of Delaware on the north which lieth under the 40^{th} degree of latitude, where New England terminates. And all that tract of land from the aforesaid bay of Delaware in a right line, by the degree aforesaid, to the true meridian of the first fountain of the Potomac, and from thence tending down toward the south to the further bank of said river, and following the W. and S. side of it, &c., to the beginning." Under this grant, Lord Baltimore claimed the whole peninsula from the above

mentioned "right line" as the S. boundary, N. to lat. 40° . But in the preamble to his grant he was restricted to lands *hactenus inculta*, "hitherto unsettled," and the Dutch had previously settled on the W. shore of the Delaware; they therefore resisted his claim to the whole peninsula. In 1664 Charles II. granted the Dutch possessions to his brother James, the duke of York, who, after conquering them, assumed the place of the Dutch in resisting Lord Baltimore. It is proper here to remark, that the sole geographical knowledge of these regions at that time was obtained from a map made by the celebrated Capt. John Smith. On this map the line of 40° was incorrectly placed as far S. as the vicinity of the parallel which is now the N. boundary of Maryland. In 1681 Charles II. granted to William Penn the territory of Pennsylvania, as follows: "All that tract, or part of land, in America, with the islands therein contained, as the same is bounded on the east by Delaware river, from 12 miles northward of New Castle town, unto the three and fortieth degree of N. latitude, if said river doth extend so far northward, but if not, then by a meridian line from the head of said river to said 43^{d} degree. The said land to extend westward 5 degrees in longitude, to be computed from said eastern bounds. And the said lands to be bounded on the north by the beginning of the three and fortieth degree of northern latitude, and on the south by a circle drawn at 12 miles distance from New Castle, northward and westward unto the beginning of the fortieth degree of northern latitude, and then by a straight line westward to the limits of longitude above mentioned." In 1682 Penn despatched a colony to his territory, and soon afterward it was discovered, by an astronomical observation, that the true parallel of 40° was so far north as to exclude him from any portion of the coast and from any territory on Delaware bay. Wishing to command an outlet to the ocean, he therefore, in Aug. 1682, purchased the duke of York's right to the land 12 m. around New Castle, and to all the W. coast of Delaware bay, below that, to Henlopen. Upon Penn's arrival in America with additional colonists in the autumn of 1682, he addressed himself to arranging the boundaries with Lord Baltimore; but not being able to make terms with him, the matter was referred to the king. At this juncture Charles II. died, and the duke of York ascended the throne as James II. He decided in favor of Penn's rights on Delaware bay, and ordered that part of the peninsula which is between the latitude of Cape Henlopen and 40° to be divided by a right line into two equal parts, that the E. half should belong to Penn, and the W. to Lord Baltimore. On May 10, 1732, the heirs of Penn and Calvert entered into an agreement for the final adjustment of their disputed boundaries. A semicircle was to be drawn at 12 m. around New Castle, N. and W. An E. and W. line was to be drawn, beginning at Cape Henlopen, and running W. to the "middle point" of the penin-

sula. From that middle point a line was to be run northward, so as to form a tangent with the circle around New Castle. From the tangent point a line was to be continued due N. until it reached a point whose latitude would be the same as that of 15 m. S. of the southernmost part of Philadelphia. From this point a due W. line should be run to the utmost longitude of Pennsylvania. In 1782, and again in 1789, commissioners were appointed to run these lines, but they had not proceeded far before new questions arose, and an appeal was made to the court of chancery in England. After a decision upon the question submitted, new commissioners were appointed in 1780, and again disagreed, and again an appeal was made to chancery. After some further delay an agreement was come to in 1760, and in November of that year commissioners to run the lines met in New Castle. Their surveyors (of whom the chief were John Lukens and Archibald McOlean and his 6 brothers) then commenced their duties. Their progress through the dense forests was slow. During the three subsequent years they had completed their line across the peninsula, as well as the long tangent line; they had measured the radius from New Castle, and established the "tangent point." The proprietors, residing in London, and ignorant of the time and labor necessary in these surveys, grew impatient, and now employed Charles Mason and Jeremiah Dixon to complete them. These mathematicians arrived in Philadelphia, Nov. 15, 1768, and in December commenced their work, in connection with the McOleans, of the old surveyors. They first proceeded to determine the latitude of the southernmost point of the city of Philadelphia. It is recorded in their journal that in Nov. 1768, they employed a carpenter to construct an observatory in the S. part of Philadelphia. This was the first observatory in America. On Jan. 6, 1764, they determined its latitude. They then carefully examined the various lines run by the old surveyors, their predecessors, which they adopted as correct. In the autumn of 1764 they ran their parallel of latitude W. to the Susquehanna, thus commencing the famous line which bears their name. In 1764-'5 they ran the line due N. from the tangent point to the N. E. corner of Maryland, and in 1765 described such portion of the semi-circle around New Castle as enabled them to fix the point which is now the point of intersection of the three states. Then beginning where they had left off at the Susquehanna, they continued their line due W. On Oct. 27 they had reached the North mountain. On June 4, 1766, they were at the summit of the Little Alleghany. The Indians now became troublesome, but a negotiation was had with them by Sir William Johnson, and in May, 1767, a delegation of Indians was sent to the surveyors, with permission from the Six Nations to continue their surveys, and as an escort to protect them against the roving savages of the south. On June 8 they recommenced their line at the Little Alleghany.

On the 14th they had advanced as far as the Great Alleghany, where they were joined by their escort of 14 Indian warriors and an interpreter, headed by the celebrated Mohawk chief Hendrick. Mason and Dixon now continued their advance with a motley host of red and white men, comprising, in addition to the Indians, surveyors, chain bearers, rod men, axe men, commissaries, cooks, and baggage carriers, with numerous laborers, servants, and camp followers. Among these, beside the 7 brothers McOlean, who afterward became prominent in the revolution, were Hugh Crawford, an old Indian trader, who for his services obtained a grant of valuable land, Paul Larsh of George's creek, and John Tate of Redstone. At a point 244 m. from the Delaware, and within 86 m. of the whole distance to be run, they came to an Indian war path, where the line crosses the Warrior branch of the old Catawba war path, at the second crossing of Dunkard creek. Here their Indian escort told them that it was the will of the Six Nations that the surveys should be stayed. There was no alternative, and retracing their steps, they returned to Philadelphia, and, reporting to the commissioners, received an honorable discharge on Dec. 26, 1767. At the end of every 5th mile a stone was planted, graven with the arms of the Penn family on one side, and of Lord Baltimore on the other. The intermediate miles were marked with smaller stones having an M on one side and a P on the other. The stones were all sent from England. The establishment of this line terminated the border war, which for nearly 90 years had kept the respective adherents of Baltimore and Penn in a state of constant hostility, although for half a century more frequent litigations were the result of the contest. Mason and Dixon returned to England, and were subsequently elected members of the royal society, under whose directions they observed the transit of Venus across the sun at the Cape of Good Hope in 1768. Dixon died in Durham, England, in 1777, Mason near Philadelphia in 1787. In Nov. 1782, Col. Alexander McOlean of Pennsylvania, and Joseph Neville of Virginia, ran the remaining part of the line from the war path crossing of Dunkard creek to the S. W. corner of Pennsylvania, thus completing William Penn's limit of "5 degrees of longitude" from the Delaware. This remaining part was tested and corrected by astronomical observations, and permanently marked, in 1784.—The stone at the N. E. corner of Maryland having been removed, and a desire being manifested to have the former surveys revised, in 1849 commissioners were appointed by the states of Delaware, Maryland, and Pennsylvania, who called to their aid Lieut. Col. James D. Graham, of the U. S. topographical engineers. Col. Graham corroborated in all important points the work of the old surveyors, and of Mason and Dixon. He, however, detected some errors. The radius was found to be 2 feet 4 inches too short; the "tangent point" had been placed 157 feet too far to the N., and

the point of intersection of the 3 states 148 feet too far to the S. This affected merely the arc of the circle reaching into Maryland, and resulted in flattening the arc, and making the state of Maryland one acre and $\frac{1}{10}$ larger than Mason and Dixon left the province of the same name. The other lines were found to be correct.

MASORA. See **BIBLE**, vol. iii. p. 227.

MASOVIA, or **MAZOVIA**, during the earlier centuries of independent Poland, a duchy or principality on both sides of the middle Vistula, inhabited by the Mazurs, a Polish tribe. In the Russian kingdom of Poland, it formed a government with Warsaw as its capital, now officially called the government of Warsaw.

MASQUE, a species of dramatic entertainment, comprehending scenic effects and dancing, much cultivated in Europe during the 16th and 17th centuries, and which reached its highest point of perfection in England in the reign of James I. Originating in the pageants, shows, and religious processions of the middle ages, the actors in which wore masks, and in the early miracle and moral plays, it gradually became a recognized form of the spoken drama, and the only one in which females, generally ladies of rank, took part. In the reign of James I. Ben Jonson and the leading dramatic authors, with the exception of Shakespeare, wrote masques for the court. Milton's "Comus" and "Arcades" are exquisite specimens. The genius of Inigo Jones was for a number of years employed exclusively upon the decorations and elaborate machinery of the court masques, and Henry Lawes furnished the music for several of them. The queens of James I. and Charles I., with the chief nobility of the court, participated in these entertainments, the preparation of which frequently occupied many months, and cost immense sums. With the death of Ben Jonson, who may be regarded as the chief writer of masques, the taste for them died away.

MASQUERADE (It. *mascherata*), an entertainment or ball, generally of a public character, in which the company are masked and otherwise disguised by dominos or fancy costumes. This species of amusement became fashionable in Italy as early as 1512, and about the same time was introduced into England by Henry VIII. It is popular on the continent of Europe, particularly in the large cities, and in carnival time; but it has been prohibited by law in many of the United States. (See **CARNIVAL**.)

MASS (Lat. *missa*), the principal form of public worship in the Roman Catholic church. According to the definition of Roman Catholic theologians, it is the true sacrifice of the new law—an offering instituted by Christ, in which, by the consecration and consumption of his body and blood under the form of bread and wine, Christ himself is mystically slain and offered as a victim to God the Father in recognition of his sovereign dominion. The derivation of the word *missa* from the Hebrew *missah* (which according to some means offering), and sev-

eral other derivations which have been proposed, are now generally abandoned, and *missa* is taken as another form of the substantive *missio*, i. e., dismissal. When first introduced, the term denoted the dismissal of the catechumens and penitents, who were permitted to be present at the introductory, but not at the sacramental service, before the beginning of which they were called upon to leave. The two parts of the service were then distinguished as *missa catechumenorum* and *missa fidelium*. This distinction ceased in the 4th century. The oldest work in which we find the term *missa* is a letter of St. Ambrose, and very soon after his time it passed into general use. The Catholic church believes that by the words of consecration, pronounced by the priest over the bread and the wine, these elements are changed into the body and blood of Christ. The sacrifice of the mass is not considered different from the sacrifice offered by Christ on the cross, but a repetition of the sacrifice of the cross, Christ offering himself again through the hands of the priest. Through it the merits of Christ are believed to be made available to men. It is called a propitiatory sacrifice, as Christ is believed to be really present as a victim, asking pardon for sinners as he did on the cross. The Roman Catholic church therefore sometimes offers masses specially for the dead, whom she mentions indeed in every mass. As she believes that Christians who leave this world without having sufficiently expiated their sins are obliged to suffer a temporary penalty in the other, she prays God, through Jesus Christ, for the remission of this penalty. The mass is called a eucharistic sacrifice, because it is believed that by offering Christ the church expresses gratitude to God in the best possible manner; and an impetratory sacrifice, because she hopes that God, touched by this offering, will grant new mercies. —In a liturgical point of view, the mass is divided into five parts: 1, the preparation, or the prayers made before the offering, which was formerly called the mass of the catechumens; 2, the offering, which extends from the offertory to the sanctus; 3, the canon, in which is included the consecration; 4, the breaking of the host and the communion; 5, the thanksgiving or post-communion. According to this rite and the language in which the mass is celebrated, different names have been given to it, as Greek, Latin, Roman, Gregorian, Ambrosian, Gallican, Gothic, Mozarabic, &c. (See **LITURGY**.) The differences between these masses concern only the form; the substance and also the principal parts are the same in all. All the liturgies also agree in prescribing the breaking of the bread, in conformity with the words of the Scriptures, which say that Christ broke the bread.—The liturgy of the mass still indicates that in former times all the people who were present communed with the priests. This usage gradually ceased, and the priest communed alone. It is now recommended to every priest to say mass frequently, and if possible daily. The presence of

one who recites the responses is as a general rule required. In modern times it has been oftentimes proposed in the church to celebrate the mass more rarely, and only when a large attendance of the people is to be expected. But the council of Trent confirmed the practice of saying private masses, and recommended to say mass frequently.—The language used at the mass is throughout the western church the Latin; only those portions of the eastern churches which are united with the Catholic, as the United Greeks, Jacobites, Copts, Chaldeans, Melchites, Maronites, and also the Illyrian and some African, as the Ethiopians, retain the right of celebrating the mass in the old language of their people (the old Greek, Syriac, Coptic, &c.). The wishes, sometimes expressed by larger or smaller bodies of the Catholic church, to translate the liturgy of the mass into the modern languages, and to let the responses at the mass be recited or sung by the entire congregation, have never been favored by the highest ecclesiastical authorities, though in some cases it has been permitted as a privilege, as for instance to the duke Eugene of Wurtemberg, who in 1786 received from Pius VI. permission to introduce the German mass into his court chapel.—There are different kinds of masses. A high or solemn mass is celebrated with the assistance of a deacon and subdeacon, and is sung by choristers; but the principal mass on Sundays and festivals, in which part of the service is sung by the priest, is also called high mass, though there are neither deacons and subdeacons nor choristers present. A low mass is one of which no part is sung, and at which the priest has no assistant but his clerk. The ordinary duration of a low mass is about half an hour. Every member of the Catholic church is bound, under pain of mortal sin, by one of the "precepts of the church," unless prevented by sickness or other grave impediment, to attend mass every Sunday and on certain holidays called days of obligation. The mass of the presanctified (*missa præsantificatorum*) is the name given to the service celebrated in the Latin church on Good Friday, when there is no consecration, but only a consumption by the priest of bread consecrated the day before. This, however, is not a mass at all, the consecration being an essential part of the sacrifice. Services of this nature are more frequent in the Greek church. At all masses the priest wears vestments which indicate by their color the ecclesiastical season of the year or the stated festival which is celebrated. Thus red is used for the feasts of martyrs, white for those of virgins, purple for the penitential seasons of Lent, Advent, and vigils. At the masses for the dead black vestments are used, some parts of the office are omitted, and the people are dismissed without the benediction. Masses may be said for any special purpose (votive masses), as for the recovery of health, for the avoiding of danger, for obtaining a special favor, &c. In the middle ages some practices crept in which the

church condemned, as the celebration of the mass without the assistance of a clerk, the combination of several masses in one in order to get a greater payment, &c. The dry or nautical mass, which during the middle ages was sometimes celebrated on board of vessels, and at which there was no consecration, was afterward forbidden by many councils.—The liturgy of the mass which is used in the Roman Catholic church received mainly its present form as early as in the time of Gregory I. From Rome it gradually passed into use in a large portion of the church. In some countries, however, particular missals were retained, contrary to the wishes of the popes. The council of Trent, in one of its first sittings, commissioned several doctors to prepare a revised edition of the Roman missal for general introduction. As this commission was, however, at the close of the council, not yet executed, the council referred the matter to the pope, Pius V. The pope appointed a committee, which prepared a new missal, using the Gregorian as a basis. It was promulgated July 14, 1570; new revisions took place under Clement VIII. in 1604, and Urban VIII. in 1634. The "congregation of rites," instituted by Sixtus V. in 1587, watches over the purity of the ritual. The Greek church and the other eastern churches hold, in the main, the same views with regard to the mass as the Roman Catholic church. The difference is mostly limited to ceremonies.—All the Protestant denominations agree in rejecting the mass, and in general the idea of a sacrifice, though some churches, especially the Lutheran and the Episcopal, have retained portions of the liturgy.

MASSAO, a S. co. of Ill., bordering on the Ohio; area, 240 sq. m.; pop. in 1855, 5,692. The surface is diversified and heavily timbered, and the soil fertile. It contains coal and lead. The productions in 1850 were 146,700 bushels of Indian corn, 4,179 of wheat, 12,607 of oats, and 2,904 lbs. of wool.

MASSACHUSETTS, one of the 18 original states of the American Union, and one of the New England states, situated between lat. 41° 15' and 42° 58' N., and long. 69° 56' and 78° 32' W.; extreme length E. and W., 160 m.; breadth varying from 47 to about 110 m.; estimated area, 7,800 sq. m., or 4,992,000 acres. It is bounded N. by Vermont and New Hampshire, E. by the Atlantic ocean, S. by the Atlantic, Rhode Island, and Connecticut, and W. by New York. It is divided into 14 counties, viz.: Barnstable, Berkshire, Bristol, Dukes, Essex, Franklin, Hampden, Hampshire, Middlesex, Nantucket, Norfolk, Plymouth, Suffolk, and Worcester. The principal cities and towns are the capital, Boston, the largest and most commercial city in New England, on Massachusetts bay; Charlestown, Roxbury, and Cambridge, in the vicinity; Salem, New Bedford, Newburyport, Nantucket, Gloucester, Marblehead, Plymouth, Dorchester, Provincetown, and Sandwich, important depots of fisheries and commerce; Lowell, Worcester, Lynn, Springfield,

Fall River, Taunton, Lawrence, Chicopee, Danvers, Andover (the seat of several literary institutions), and Haverhill, interior and manufacturing towns.—The population at each national decennial census has been as follows: 1790, 878,717; 1800, 423,245; 1810, 472,040; 1820, 528,287; 1830, 610,408; 1840, 737,689; 1850, 994,514; and at the state census of 1855, 1,182,869, showing Massachusetts to be the 6th in point of population of the states of the Union. Increase of population from 1790 to 1850, 162.59 per cent.; 1840 to 1850, 34.80; 1850 to 1855, 16.30. Of the population in 1855, there were 550,084 males and 582,385 females; 1,122,468 were white (545,417 males and 577,046 females), and 9,906 colored (4,627 males and 5,279 females). Ages: under 5 years, 132,944; 5 and under 10, 115,862; 10 and under 15, 110,098; 15 and under 20, 117,047; 20 and under 30, 235,678; 30 and under 40, 165,046; 40 and under 50, 111,500; 50 and under 60, 71,829; 60 and under 70, 42,428; 70 and under 80, 20,810; 80 and under 90, 6,138; 90 and under 100, 684; 100 and over, 19; unknown, 2,841. Natives of the United States, 886,575; of foreign countries, 245,263; unknown, 581. During the year 1858 there were 34,491 births (17,453 males, 16,840 females, and 198 not stated); deaths in the same period, 20,776 (10,346 males, 10,354 females, and 76 unknown); marriages, 10,527. The occupations of 383,532 male persons over 15 years of age were returned by the census of 1855 as follows: agriculturists, 57,081; factory operatives, 8,801; laborers, 60,248; mariners and boatmen, 16,346; manufacturers, 5,294; mechanics, 122,251; merchants, 29,039; professions, 3,312; miscellaneous, 26,220. There were 401 deaf and dumb, 471 blind, 1,919 insane, 888 idiotic, 5,687 paupers, and 2,901 convicts. Families, 228,845; dwellings, 175,811. Density of population, 145.17 to the square mile, being greater than that of any other of the United States.—From the W. for about 100 m. Massachusetts has the regular form of a parallelogram about 50 m. in width; thence it spreads out to the N. E. and S. E. on two sides of Massachusetts bay, terminating on the S. E. in the long peninsula of Cape Cod, which, describing to the N. and slightly to the W. a segment of a circle, encloses Cape Cod bay. It also includes several islands, of which Martha's Vineyard and Nantucket are the largest. Beside the two mentioned, there are Buzzard's bay on the S. coast, 30 m. long, with an average width of 7 m., and Plymouth bay, a small inlet communicating with Cape Cod bay on the W. The state has many excellent harbors. No large and navigable rivers, if we except the Merrimack, find their outlet on the coast. The Housatonic river, which rises in the W. part of the state, and the Connecticut, flow S. through Connecticut into Long Island sound; the Merrimack flows through the N. E. corner, and supplies immense water power to Lowell, Lawrence, and other manufacturing towns. The other principal streams are the Nashua, Taunton, Concord,

Blackstone, and Charles. It contains a number of small lakes, but none of considerable size.—The surface of Massachusetts is greatly diversified. The extreme W. is mountainous, having two ranges of the Green mountains, the Taghkanic or Taconic and Hoosic ridges. Saddle mountain in the N. W. corner is 3,505 feet high, and Mt. Washington in the S. W. corner 2,624 feet high. Further E. is the beautiful and fertile valley of the Connecticut. In this section are several elevations, detached members of the White mountain system, the highest peaks of which are Mt. Tom (1,200 feet) on the W., and Mt. Holyoke (910 feet) near Northampton, on the E. bank of the Connecticut river; and Wachusett mountain (2,018 feet) to the N. of the middle of the state. The E. and N. E. are hilly and broken, and the S. E. generally low and sandy.—Massachusetts is eminently a region of metamorphic rocks. Those in the E. part of the state especially are largely overspread with the sands, gravel, and boulders of the drift formation; and the long point of land making the S. E. extremity of the state (see CAPE COD) is so covered with these loose materials, that the rocky beds beneath are entirely concealed. Sienite and granite prevail along the coast, and extensive quarries of these rocks are worked at Quincy, Cape Ann, and other points. Around Boston is a formation of coarse conglomerates and argillaceous slates of obscure age on account of the metamorphic action to which they have been subjected. At Braintree, near Quincy, the slates have been found to contain trilobites, but generally no fossils have been met with in these rocks. The fossils would seem to refer the slates to the lower silurian period. These obscure formations are traced in an irregular belt toward Providence, and near the Rhode Island line they are connected with coal-bearing strata, referable, it is supposed, to the true carboniferous epoch. In many localities in Bristol and Plymouth counties these strata contain beds of anthracite, some of which, as at Mansfield, have been worked for many years. They prove, however, of little or no value, the coal always being much crushed, and the beds very irregular in their production. Gneiss and talcose and mica slates in broad belts traverse the state from N. to S. from the E. portion to the waters of the Housatonic in Berkshire. Among these rocks are interspersed a few beds of metamorphic limestone, but no minerals or ores of value. Along the Connecticut river valley the "middle secondary red sandstone" is met with in one or several belts, the northern termination of this group of rocks, which is thence traced southward as far as Virginia. Trap rocks are associated with it, and near the contact of the sandstone and trap, or of the sandstone and the gneiss, are found veins of metallic ores, as of lead, copper, and zinc, none of which, however, have repaid the money spent in their exploration. The principal localities of these ores are at Southampton, Leverett, Montague, Whately, and a few other towns. The high lands which

traverse the state from N. to S., dividing the waters that flow into the Connecticut from those of the Housatonic, and called the Hoosic mountains, are chiefly of gneiss and mica slate. In Middlefield a belt of talcose slate, contained further N. in the mica slate region, reaches the gneiss; and here are developed in near proximity beds of limestone, steatite, and serpentine. The towns along the Housatonic and on the same range extending to the N. border of the state are in the region of the altered silurian sandstones and calcareous formations. This is the most important mineral district of the state, numerous beds of iron ore having been worked for many years, and the quartz rocks affording in their disintegrated beds bodies of glass sand of unusual purity. For further reference to these products, see GLASS, HEMATITE, and IRON. —Massachusetts is naturally the least fruitful of the New England states, but careful and laborious cultivation has much improved large tracts of land which would otherwise have remained sterile. In the valleys, particularly of the Housatonic and Connecticut, the soil is rich and productive, but a large portion of the more elevated lands and the long sandy coast do not repay the husbandman. The climate near the coast is very variable, with prevailing E. winds, especially in the spring. In the interior it is more equable, and in the mountainous districts very severe in winter. The mean temperature is between 44° and 51°. Of the total area of the state, somewhat less than one half is improved. The agricultural products in 1855 were 41,000 bushels of wheat, 2,595,096 of Indian corn, 523,776 of rye, 792,823 of oats, 3,984,818 of potatoes, 241,000 of onions, 523,677 of turnips, 681,960 of carrots, 648,610 tons of hay, 8,116,009 lbs. of butter, 5,762,776 of cheese, 73,677 of honey, and 416,156 of wool. There were 2,236,900 apple trees cultivated for their fruit, yielding to the value of \$1,121,261; 185,892 pear trees, yielding \$83,144; value of other fruit, \$105,885. Total value of agriculture products, \$21,556,162. The live stock in 1855 consisted of 80,321 horses, 148,569 milch cows, 77,511 oxen, 62,727 steers and heifers, 145,215 sheep, and 51,118 swine; value, \$16,314,900. —In manufacturing industry Massachusetts stands at the head of all the states, and will compare favorably with any other portion of the world; while the condition of her operatives, their moral and intellectual character, and the happy relations existing between them and their employers, has no parallel in other manufacturing districts. In 1855 there were in the state 294 cotton mills, with 1,519,527 spindles, consuming 105,851,749 lbs. of cotton, and manufacturing 314,996,567 yards of cloth, value \$24,359,212; 3,321,646 lbs. of cotton yarn, \$880,546; 584,393 lbs. of cotton thread, \$265,934; 4,825,686 lbs. of batting, \$395,374; 370,000 of wadding, \$189,865; 2,227,620 yards of cotton flannel, \$120,056; and 15,000 lbs. of wicking, \$9,550. Capital invested in the manufacture of cotton, \$31,961,000; hands employed, males 11,987,

females 22,850. There were 6 calico manufactories, which printed 61,040,000 yards of calico, value \$5,143,000; bleached and colored but not printed, 1,000,000 yards, value \$70,000; capital invested, \$1,980,000; hands employed, 1,023 males and 184 females. Beside the foregoing, there were 11 establishments not connected with calico printing which bleached or colored 66,400,000 yards, value \$5,111,200; capital invested, \$659,000; hands employed, 644. Of woollen mills there were 146, with 695 sets of machinery, consuming 18,786,298 lbs. of wool, and manufacturing 769,627 yards of broadcloth, value \$837,650; 6,444,585 of cassimere, \$5,015,441; 6,736,082 of satinets, \$2,708,985; 1,948,609 of Kentucky jeans, \$31,000; 10,279,227 of flannel or blanketing, \$3,125,949; and 689,957 lbs. of woollen yarn, \$886,537; capital invested, \$7,305,500; hands employed, 5,946 males and 4,144 females. There were 275,000 lbs. of wool consumed in the manufacture of satinets at Stockbridge, which with a few smaller items are not included in the above. There were 13 carpet mills, consuming 53,000 lbs. of cotton and 2,880,974 of wool, and manufacturing 1,988,460 yards of carpeting, value \$1,862,819; capital invested, \$2,264,172; hands employed, 780 males and 884 females. Beside these there were 4 mills for the manufacture of painted carpeting, capital \$12,500, producing 88,000 yards; 20 hosiery manufactories, capital \$169,980, employing 116 males and 140 females, and producing to the value of \$207,160; 4 linen manufactories, capital \$550,000, employing 465 males and 445 females, and producing 2,600,000 yards, value \$1,240,000, and 1,150,000 lbs. of thread, value \$200,000; 5 silk factories, capital \$55,000, employing 85 males and 103 females, and producing 44,000 lbs. of sewing silk, value \$300,000; 49 rolling, slitting, and nail mills, with 788 nail machines, capital \$2,342,825, employing 3,025 hands, and producing 34,557 tons of nails, value \$2,786,966, and 85,934 tons of other manufactured iron, value \$2,725,850; 15 machines for making horse nails, capital \$60,000, and one establishment for the manufacture of zinc nails and brads, capital \$10,000; 206 forges, capital \$739,600, employing 547 hands, and manufacturing 6,746 tons of bar iron, anchors, chain cables, &c., value \$915,980; 44 steam engine and boiler establishments, capital \$2,099,500, employing 2,638 hands, and manufacturing to the value of \$3,225,000; 109 establishments for the manufacture of machinery, capital \$2,494,000, employing 3,740 hands, and producing to the value of \$4,089,590. There were 32 flour mills, producing 263,100 barrels, value \$2,040,040; 266 tanneries, producing 2,104,172 tanned hides, value \$4,786,369; and 250 currying establishments, value of leather curried \$1,698,433, patent and enamelled leather \$1,271,942. There were 11,892,829 pairs of boots and 38,174,499 of shoes manufactured, value \$37,501,723; straw bonnets 3,326,080, and straw hats 1,907,485; bricks 108,353,000, value \$2,627,165. The value of other

manufactures for 1855 was: fire engines, \$50,000; scythes, \$120,582; axes, hatchets, and edge tools, \$626,654; cutlery, \$578,625; screws, \$180,000; butts and hinges, \$22,000; tacks and brads, \$621,212; shovels, spades, forks, and hoes, \$894,515; ploughs, \$707,175; other agricultural implements, \$56,805; iron railings, fences, and safes, \$656,400; window glass, \$48,125; other glass, \$2,600,000; starch, \$195,000; chemical preparations, \$1,095,600; paper, stock used 632,158 tons, quantity made 17,959 tons or 711,958 reams, value \$4,141,847; pianofortes and other musical instruments, \$2,656,880; hats (not including straw hats) and caps, \$850,873; cordage, \$686,400; oil and sperm candles, \$6,813,290; tallow candles, \$366,167; soap, \$7,354,866; powder, \$228,125; firearms, \$391,475; cannon, \$54,151; chairs and cabinet ware, \$3,969,982; combs, \$557,422; white lead, \$629,850; other paints, \$280,340; linseed oil, \$890,000; building stone quarried, \$1,565,212; marble, \$561,650; wooden ware, \$745,711; whips, \$505,500; corn and other brooms, \$323,135; lasts, \$179,450; shoe pegs, \$12,900; lumber prepared for market, \$3,664,462; firewood, \$3,960,915. Some of the above statistics are deficient, owing to incomplete returns. According to the official returns, which, however, are not entirely full, the number of vessels engaged in the whale fisheries in 1855 was 492, tonnage 154,061; capital invested, \$14,546,548; hands employed, 11,864; sperm oil received, 2,068,809 gallons, value \$3,059,018; whale oil, 6,645,684 gallons, value \$3,905,605; whalebone, 2,037,300 lbs., value \$802,378. Vessels employed in the mackerel and cod fisheries, 1,145, tonnage 77,986; capital invested, \$3,696,436; hands employed, 10,551; mackerel taken, 153,464 lbs., value \$1,355,332; codfish, 439,380 quintals, value \$1,413,418; cod liver oil, \$60,895; salt consumed, 424,549 lbs.; alewives, shad, and salmon, 52,278 bbls., value \$73,156. Vessels launched 156, tonnage 92,869. Total industrial production in 1855, \$295,820,681.—The exports from Massachusetts for the year ending June 30, 1859, were valued at \$18,158,818, of which \$16,086,608 was domestic and \$2,122,215 foreign; imports, \$43,184,500. Clearances 2,755, tonnage 758,885; entrances 4,020, tonnage 882,498. The total tonnage on June 30, 1859, was 829,034, of which 154,048 was employed in the whale fishery, 71,596 in the mackerel and cod fishery, and 20,680 was steam.—On Jan. 1, 1860, there were 176 banks of issue, whose liabilities were as follows: capital, \$64,519,200; circulation, \$18,081,121; deposits, \$26,204,518; profits on hand, \$6,942,147. Resources: notes, bills of exchange, &c., \$107,309,870; specie, \$6,278,498; real estate, \$1,608,613; total, \$115,696,981. On Nov. 1, 1859, there were 86 savings banks, with deposits to the amount of \$39,424,418 from 205,409 depositors. From 1851 to 1859, 176 joint stock companies were incorporated, with an aggregate capital stock of \$11,349,200; cash paid in, \$7,952,983.—The following table exhibits the extent

and cost of the various railroads lying wholly or partly in Massachusetts on Nov. 30, 1859:

| Railroad corporations. | Length of road and branches in miles. | Cost of roads and equipments. |
|--|---------------------------------------|-------------------------------|
| Agricultural Branch..... | 28.36 | \$350,238 89 |
| Amherst, Belchertown, and Palmer..... | 19.56 | 85,000 00 |
| Berkshire..... | 21.14 | 600,000 00 |
| Boston and Lowell..... | 27.61 | 2,423,592 79 |
| Boston and Maine..... | 58.05 | 4,219,740 85 |
| Boston and Providence..... | 54.00 | 3,160,000 00 |
| Boston and Worcester..... | 68.62 | 4,728,580 88 |
| Cape Cod..... | 47.14 | 1,081,625 15 |
| Obseahire..... | 58.65 | 3,075,964 45 |
| Connecticut River..... | 52.35 | 1,301,948 80 |
| Danvers..... | 9.20 | 218,889 68 |
| Dorchester and Milton Branch..... | 8.25 | 186,789 48 |
| Eastern..... | 74.62 | 4,590,999 88 |
| Easton Branch..... | 8.75 | 55,594 47 |
| Essex..... | 21.18 | 747,008 88 |
| Fairhaven Branch..... | 15.11 | 396,785 14 |
| Fitchburg..... | 67.78 | 3,540,000 00 |
| Fitchburg and Worcester..... | 12.99 | 278,000 00 |
| Hampshire and Hampden..... | 94.96 | 577,588 73 |
| Hartford and New Haven..... | 8.02 | 809,218 18 |
| Horn Pond Branch..... | .66 | 18,075 53 |
| Lexington and West Cambridge..... | 6.28 | 251,257 75 |
| Lowell and Lawrence..... | 12.85 | 868,156 13 |
| Marlborough Branch..... | 3.90 | 156,184 80 |
| Medway Branch..... | 2.80 | 87,206 75 |
| Midland..... | 74.50 | ..... |
| Middleborough and Taunton..... | 8.04 | 158,942 79 |
| Nashua and Lowell..... | 14.53 | 654,008 33 |
| New Bedford and Taunton..... | 21.59 | 547,487 18 |
| Newburyport..... | 28.98 | 648,968 95 |
| New London, Willimantic, and Palmer..... | ..... | ..... |
| New York and Boston, in Massachusetts..... | 32.00 | 484,884 22 |
| Norfolk County..... | 26.00 | ..... |
| Norwich and Worcester..... | 68.40 | 2,618,694 21 |
| Old Colony and Fall River..... | 87.95 | 3,484,164 81 |
| Peterborough and Shirley..... | 14.07 | 285,896 81 |
| Pittsfield and North Adams..... | 18.65 | 443,677 67 |
| Providence, Warren, and Bristol..... | 13.60 | 481,667 22 |
| Providence and Worcester..... | 44.41 | 1,761,549 47 |
| Salem and Lowell..... | 16.58 | 449,580 22 |
| South Reading Branch..... | 8.37 | 299,468 86 |
| South Shore..... | 11.50 | 501,692 26 |
| Stockbridge and Pittsfield..... | 21.98 | 448,700 00 |
| Stony Brook..... | 13.16 | 267,888 87 |
| Stoughton Branch..... | 4.04 | 99,477 96 |
| Taunton Branch..... | 11.67 | 313,156 06 |
| Troy and Greenfield..... | 42.55 | 478,048 58 |
| Vermont and Massachusetts..... | 77.00 | 2,516,885 81 |
| Western..... | 73.26 | 11,080,279 41 |
| West Stockbridge..... | 2.75 | 82,600 00 |
| Worcester and Nashua..... | 45.69 | 1,823,597 68 |
| Total..... | 1,602.48 | \$63,818,848 84 |

At the same date there were 15 horse railroad companies; cost of roads and equipments \$2,266,442.76, aggregate length 88.21 m.; net income, \$183,241.11. The capital stock of the above roads was \$61,473,500; paid in capital, \$50,194,057; debt, \$17,958,375; total income, \$10,871,880; working expenses, \$6,330,292; interest paid, \$819,297; net income, \$3,674,658; amount of dividends, \$2,468,588.—On Nov. 1, 1859, there were 36 stock insurance companies, with a paid in capital of \$6,736,100; fire risks outstanding, \$126,151,695; marine risks, \$45,545,105; premium in cash on fire risks \$1,848,920, on marine risks \$1,187,844; in notes on fire risks \$4,194, on marine risks \$2,023,723; fire losses paid the last year, \$804,761; marine losses, \$2,203,780; dividends, \$1,222,042. Of mutual marine and mutual fire and marine insurance companies there were 14, having \$1,089,586 invested in various stocks and

cash, and \$4,948,722 in notes and other securities; they paid in the year \$60,866 for fire losses and \$1,701,406 for marine losses. The number of mutual fire insurance companies was 67, which had insured on existing policies \$218,887,645; received for premiums and deposits in cash \$2,861,915, and paid for losses \$359,988. There were 5 life insurance companies, having an amount insured of \$22,048,804; amount of assets, \$2,984,878; received for premiums, in cash \$408,702, notes or securities \$158,899. All the insurance companies are under the supervision of 2 state commissioners.—According to the census of 1850 there were 1,475 churches, of which 266 were Baptist, 80 Christian, 448 Congregational, 54 Episcopalian, 80 Friends', 7 free, 262 Methodist, 15 Presbyterian, 41 Roman Catholic, 168 Unitarian, and 128 Universalist, the remainder belonging to a variety of sects. The number of public schools in 1859 was 4,444, with 204,925 pupils in summer and 211,888 in winter; average attendance in summer 160,108, in winter 166,520; male teachers 2,028, female 8,180; average length of school during the year, 7 months and 17 days; average wages of male teachers per month, including the value of board, \$48.90; of female teachers, \$19.02; amount of money raised by taxes for the support of schools, \$1,890,882; voluntarily contributed, \$29,809. The school fund is \$770,756, from which is derived an annual income of \$41,048. The number of incorporated academies in 1859 was 63, with an average of 8,932 pupils; aggregate paid for tuition, \$74,228. There were 691 unincorporated academies, with an average of 18,903 pupils; aggregate paid for tuition, \$333,940. The ratio of attendance (163,814) of children between 5 and 15 to the whole number in the state (220,879) is 74 per cent. Four normal schools are supported by the state, of which those at Framingham and Salem are intended to prepare young women for the career of teachers. At the former, in 1859, 57 had been admitted, 34 graduated, and 15 dismissed; whole number belonging to the school, 70. At Salem, 86 were admitted in 1859, and 41 graduated; whole number of pupils, 139. The institutions at Westfield and Bridgewater are intended for both sexes, and had an attendance in 1859 respectively of 186 and 99. The state contains 5 colleges, viz.: Harvard at Cambridge, Williams at Williamstown, Amherst at Amherst, Holy Cross at Worcester, and Tufts at Medford, with an aggregate of 995 students.—Massachusetts contains a large number of charitable institutions, all of which are highly reputed for their enlightened and efficient management. The Perkins institution and Massachusetts asylum for the blind had on Sept. 30, 1859, 128 blind persons connected with it, viz.: 8 teachers, 3 assistants, 88 pupils, and 29 workmen. At Worcester, Taunton, and Northampton are state lunatic hospitals, having at the same date an aggregate of 891 patients, 415 males and 476 females. During the year ending Sept. 30, 1859,

31,400 paupers were relieved or supported by the cities and towns, of whom 10,869 were in 222 almshouses, at a net expense of \$522,312. For the same period 1,892 indigent children under 14 years of age were supported at the public charge. There are 3 state almshouses, at Bridgewater, Monson, and Tewksbury, containing an aggregate of 1,624 inmates. The Rainsford island hospital, Boston harbor, had 159 patients; the cases are mainly from immigrant vessels. The state reform school at Westborough, for juvenile offenders, contained 505 boys; and the state industrial school for girls at Lancaster had 99 girls. The Massachusetts school for idiotic and feeble-minded youth had 67 pupils, of whom 45 were supported by the state, 4 partly by other states, 4 partly and 14 wholly by friends. The state prison contained at the above date 491 convicts; expenditures during the year, \$87,821; receipts \$78,647, of which \$65,889 was for the labor of convicts. On Oct. 1, 1858, there were 508 prisoners in the gaols, and 1,490 in houses of correction; average, 1,799; committed during the year, 18,466, viz.: to gaol 8,286, to houses of correction 5,180; expenses, \$216,252; value of labor, \$59,902.—The executive department of the government consists of a governor elected for 1 year, salary \$3,500; lieutenant-governor, \$600, with extra pay and mileage for attendance at other than regular sessions of the council; secretary, treasurer and receiver-general, and auditor, each \$2,000; attorney-general, \$2,500; heads of bureaus, and an executive council composed of 8 members, elected annually from the same number of divisions of the state, who receive \$300 each for the regular annual session of their board, \$3 per day for any subsequent session, and 20 cents a mile for travel. The legislative department consists of a senate and house of representatives, annually elected; in the former there are 40 members, in the latter 240. Their pay is \$300 for the regular annual session, and 20 cents a mile for travel; a deduction of \$3 per day is made for non-attendance unless excused by the house of which the delinquent is a member. The president of the senate and the speaker of the house of representatives receive each \$600 for the session. The judiciary comprises a supreme judicial court, consisting of a chief justice, salary \$4,500, and 5 justices, \$4,000 each. This has exclusive cognizance of all capital crimes, exclusive chancery jurisdiction so far as chancery powers are given by statute, and concurrent original jurisdiction of all civil cases where the amount in dispute exceeds \$4,000 in Suffolk, and \$1,000 in other counties. The superior court is held for the trial of all civil cases above \$200, and has criminal jurisdiction in all except capital cases; it has a chief justice, salary \$3,700, and 8 justices \$3,500 each. The legislature in 1858 united the courts of probate and the court of insolvency. For probate and insolvency purposes, frequent courts are held at different places by the judge in the various counties. A register of probate and insolvency is

elected by the voters of each county for a term of 5 years, and there are 5 assistant registers. There are 14 judges and the same number of registers, with salaries varying from \$800 to \$3,000. The resources of the state on Jan. 1, 1860, were as follows: unproductive real estate, \$3,116,179.56; railroad bonds and mortgages for scrip loaned, \$5,049,188.56; railroad stock, Massachusetts school and other funds, \$5,354,005.44; total, \$18,519,868.56. The liabilities were: scrip issued on account of reform school, state prison, hospitals, state house, almshouses, and loan of 1856, \$1,814,000; scrip loaned railroad companies, payable by them, \$5,049,188; temporary loan for money borrowed in anticipation of sale of scrip, and of revenue, &c., \$324,647; amounts due from state treasury and uncalled for, \$55,597.88; grants to sundry institutions from the avails of sales of Back bay lands, \$200,000; total, \$6,948,428.44; surplus, \$6,575,940.12. Total receipts for 1859, \$3,016,697.88; total payments, \$3,078,206.86; excess of payments, \$56,508.48.—The continent of North America is claimed and generally conceded to have been discovered by Norwegian navigators in 986, when Biörn on a voyage from Iceland to Greenland, having lost his reckoning, went so far beyond his destination as to come in sight of the mainland on the W. In 1000 Leif, stimulated by the report of Biörn, sailed in search of the new land, found it, went on shore, reëmbarked, and sailing southward, wintered at a place by him called Vinland or Wineland, from the abundance of its grapes. Thorwald, a brother of Leif, sailed for Vinland on the return of the latter, and discovered several islands. The expedition remained there about 8 years. Thorwald, having been killed by a native, was succeeded at intervals by other adventurers and explorers. This discovery led to various unsuccessful attempts at colonization, continued during a period of more than 300 years. Vinland has been thought to be that part of the continent occupied by the S. E. portion of Massachusetts and Rhode Island. In 1497 John Cabot, sailing on a general voyage of discovery under a patent granted by Henry VII., skirted the E. coast of North America, and landed, but without observing any inhabitants. His son Sebastian, who had accompanied him in the above expedition, while on a voyage to discover a N. W. passage to China and Japan, made several landings on the North American coast, in which he saw some of the natives, taking 3 with him to England. Gaspar Cortereal, the Portuguese navigator, also visited the coast in 1500-'1, as far S. probably as Connecticut, and returned with 57 Indians, whom he sold as slaves. John Verrazzano, a Florentine, Stephen Gomez, in the service of Spain, and others afterward landed upon the coast; but no special attempt was made for many years by the English, who claimed it under the discovery of the Cabots, to avail themselves of the advantages thus acquired. Though the fisheries off Newfoundland had engaged some attention, and formal

possession had been taken of that island, that part of the continent now known as New England was neglected until 1602, when Bartholomew Gosnold with a colonizing expedition of 32 persons, sailing in a direct course across the Atlantic, made the land in Massachusetts bay, at a point supposed from description to be Salem harbor. Standing to the southward, he passed and named Cape Cod from the fish there taken, and keeping on further discovered and named a small island Martha's Vineyard, now called No Man's Land, the former name being subsequently transferred to the large island to the N. He afterward selected a little island now known as Outtyhunk, and forming the southernmost of the group of Elizabeth islands, but which he called Elizabeth island, for settlement. Here a portion of the company built a house fortified with palisades and thatched with sedge, and a stone cellar, while the others went into the interior on a trading expedition to the Indians. The settlement was however abandoned within a few weeks, dissensions among themselves, difficulties with the Indians, and scarcity of provisions having disheartened those who were to have remained. This was the first settlement made in Massachusetts by Englishmen, and these were the first Englishmen who stood upon its soil, more than a century after it had been discovered by John Cabot the Venetian. New interest in the discovered but yet unexplored region was aroused by the expedition of Gosnold, and in the following year two small vessels commanded by Martin Pring or Prynn set out on a venture, the main purpose of which was commercial, as they took commodities intended to be bartered with the savages for sassafras, then greatly esteemed for its medicinal properties. They rested in what is conjectured to be the present Edgartown in Martha's Vineyard; but the threatening manner of the Indians hastened their departure after a sojourn of only 2 months. In 1605 and 1606 French expeditions visited the coasts with the intention of securing possession of the country, but the hostility of the natives and the severity of the weather frustrated their purpose. A futile voyage of George Waymouth in 1605, resulting merely in the seizure of 5 savages, led indirectly to a more extensive and determined but unsuccessful attempt to colonize the country. A movement, mainly promoted by Sir John Popham, chief justice of the king's bench, and Sir Ferdinando Gorges, at that time governor of Plymouth, led to the formation of two companies, one of which, the Plymouth company, under the direction of "sundry knights, gentlemen, and other adventurers of the cities of Bristol and Exeter, and of the town of Plymouth and of other places," had assigned to them North Virginia, lying between the parallels of 38° and 45°. They were empowered to expel intruders, coin money, impose taxes and duties for their own use for 21 years, and for 7 years import goods free of duty from other parts of the British dominion. They were

held to pay into the royal treasury 20 per cent. of the product of gold and silver mines which might be discovered, and $\frac{1}{4}$ of that rate on copper. Both companies were to be under the control of a body of 18 called the council of Virginia, and appointed by the crown. The coasts of New England were surveyed by a vessel despatched for that special purpose, and which returned with encouraging accounts. A well provided expedition sent out by this company made a brief settlement in Maine, and then returned discouraged. Capt. John Smith, on a voyage made in 1614, drew a map of the country, which he called New England; and the principal points had names given them by the prince, afterward Charles I. Immediately on his return Smith was engaged by the Plymouth company, who fitted out a new expedition of two ships after much exertion, and intrusted the command to him. The smaller vessel, under Capt. Dermer, made the voyage, obtaining a freight, but accomplishing nothing more; but Smith, compelled to put back by the unseaworthiness of his vessel, failed, after various attempts and many adventures, to achieve his object. Several other voyages were made under the auspices of the company, chiefly for purposes of traffic, meeting however with no success. But soon motives more powerful and durable than the pursuit of gain led to the permanent colonization of these shores. Among the English who had sought religious liberty in Holland were a number from Nottinghamshire, who had escaped after many perils, and, not mingling with those who under similar circumstances had fixed their abode in Amsterdam, selected Leyden for a resting place. Of this community John Robinson was pastor and William Brewster an elder. But the strange people, the strange language, and the change from agriculture to trade or mechanical labor, rendering their residence irksome and unsatisfactory, they resolved to brave the dangers of the sea, the hostility of the savages, and the "famine, and nakedness, and the want, in a manner, of all things, with sore sickness," so that they might be free and untrammelled, and in some way again joined to the country they never ceased to love. Having determined, after considering various projects, to settle in America under the Virginia company, if they could obtain from the crown the privilege of religious freedom, two of their number, Robert Cushman and John Carver, were sent to negotiate with the company and to petition the king. With the former they made terms, but from James they could only obtain an implied assurance of non-interference. After annoying delays a patent was obtained from the Virginia company in the name of one who did not accompany the expedition, and for lands they did not occupy, and which was consequently of no value. The means necessary to defray the expenses of the voyage and the first settlement were to be furnished by a company who, in the arrangement for a participation in the profits, rated the labor of each

emigrant above 16 years of age as a capital of only £10. All profits were to be reserved for 7 years, when the whole amount, and all houses and land, gardens and fields, were to be divided among the shareholders according to their respective interests. All the arrangements having been completed, the pilgrims embarked at Delft Haven, July 22, 1620, in the *Speedwell*, a little vessel of 60 tons burden, after a solemn and affecting leave-taking from their brethren, among whom was their pastor John Robinson, many being obliged to remain, as it was intended that at first none but the youngest and strongest should go. Arriving at Southampton, they found the *Mayflower*, of 180 tons, which had recently come from London, and the two vessels sailed together, Aug. 5, for the new world. The *Speedwell* proving leaky, both vessels put in at Dartmouth, and after a detention of 8 days again set sail. But the master of the smaller ship, after they had gone about 800 miles, insisted on relinquishing the voyage for the alleged reason of her unfitness, and they returned to Plymouth. Then, after permitting those who chose to abandon the enterprise, 102 souls set sail, Sept. 6, in the *Mayflower*. After a voyage of 68 days, the latter part of which was rough and stormy, and during which they lost one of their number, they made the land of Cape Cod, and on Nov. 11 were riding safely at anchor in the roadstead of the present Provincetown. Before landing they drew up and subscribed a solemn compact or constitution, by the terms of which they were to be ruled; and immediately after John Carver was elected governor for one year. An exploring party spent some days in searching for a favorable place to commence the settlement, and they at last landed at Plymouth, Dec. 22. The settlers at once began the building of works for defence, laid out 19 plots for dwellings, the number of the families into which they were divided, and agreed "that every man should build his own house." But the severity of the weather, exposure, and bad food brought on sickness, which took off nearly half their number in about 4 months; and so reduced in strength and numbers were the survivors that they were scarce able to attend the dying or bury the dead. Soon after landing they had communication with the Indians, and made a treaty of amity with Massasoit and his people, with whom they remained friends for a long period. With other chiefs and tribes they had occasional disputes and skirmishes, but they soon acquired an influence and control which relieved them from serious molestation. In these matters Capt. Miles Standish achieved great reputation. In the following spring the *Mayflower* departed, and shortly after the colony met with a grievous loss in the death of Gov. Carver. William Bradford was thereupon elected to the vacancy, with Isaac Allerton as his assistant. Until 1623, when they had a plentiful harvest, the colony endured many privations, and were often near famishing. But in that year some changes were made in the

system of labor, and the plan of common property was abandoned. During this time the colony received accessions from abroad, and other settlements were attempted. The Fortune, which arrived about 11 months after the first settlement with a reinforcement of some 80 emigrants under Cushman, was sent back with a freight of beaver skins and clapboards to the value of £500, the first proceeds of the enterprise, to the company in England. A new patent was obtained in 1622 by Mr. Weston of London, formerly connected with the Plymouth colonists, under which he despatched an expedition to settle for him a plantation in Massachusetts bay. They were hospitably received and entertained at Plymouth, and commenced a plantation at Wessagusset, now Weymouth. They were unfitted for the undertaking, being careless, improvident, and regardless of the rights of others; they received many favors from the Plymouth colony, which were ill requited, and almost brought upon them an attack from several combined tribes of Indians who were incensed at their aggressions. Meanwhile the Plymouth colony began to thrive, but various causes of trouble with the company in London had grown up, from which they became anxious to obtain a release. The result of negotiations was that 7 or 8 of the principal men undertook on behalf of the colony the payment of £1,800 in 9 equal annual instalments. A new organization was then formed, a partnership entered into, the stock and land divided, and they became individually independent property holders. All efforts to obtain a patent from the crown were unavailing, and the Plymouth colonists were thus obliged to carry on their government without the royal sanction. They quietly assumed all the necessary powers and discharged all the functions of the state. A governor, with a council of 5, afterward 7, assistants, and a legislature consisting at first of the "whole body of the male inhabitants," made and administered the laws by which the state was ruled. In the mean time other influences were at work to extend the range of settlements. A number of gentlemen of Dorchester, England, having much interest in the fisheries and trade of New England, organized an association for the establishment of a settlement on Cape Ann, a scheme in the direction of which Mr. John White had much influence. This was unsuccessful; but another company was subsequently formed, which obtained a grant of territory lying between the Atlantic and the Pacific, and extending 8 m. S. of the river Charles and Massachusetts bay and 8 m. N. of every part of the river Merrimack. Under these auspices an expedition reached Salem in 1628, commanded by John Endicott. Upon the news of Endicott's safe arrival renewed interest was excited, new associates joined, and a royal patent was at last obtained for the company of the Massachusetts bay. The charter established a corporation, and the associates were constituted a body politic. Its officers were a governor

deputy, and 18 assistants, to be annually elected. A general assembly of the freemen, to be held 4 times a year or oftener if required, was intrusted with legislative powers. The question of religious liberty was avoided in the instrument, but the making of laws contrary to those of England was strictly forbidden. In 1629 a reinforcement was despatched of 800 men, 80 women, and 26 children, with victuals, arms, tools, cattle, and goats; and in the same year it was determined to transfer the government and patent of the company from London to New England. The old officers resigned, and new officers were appointed from among those who intended to emigrate, John Winthrop being made governor. A new emigration was thus promoted, and soon the colony received an accession of about 1,000 persons, who had been conveyed in 17 vessels. Their reception was discouraging; the settlers were sick and weak, their food and strength almost exhausted. Sites for settlements were promptly selected; and the names of Charlestown, Boston, Watertown, Dorchester, Roxbury, Salem, Mystic, Saugus (Lynn), and others, occur in the history of this period. This colony suffered great hardships. Many died, and others, disheartened, returned to England; yet those who remained preserved their fortitude amid all discouragements. In the organization of their government particular attention was paid to the observances and maintenance of their religion and the civil rights of the individual. Though at first somewhat aristocratic, the government soon received various liberal modifications, adopting, however, a religious test of citizenship. They established peaceful relations with the Indians; and, desiring to promote friendly sentiments with the other European settlements, Gov. Winthrop and Wilson, pastor of Boston, visited the old or Plymouth colony in Oct. 1632, were received by Bradford and Brewster, and kindly welcomed and entertained by the people. The Massachusetts company continued to receive additions from England, and in the exercise of their political and religious privileges manifested a jealous and vigilant interest. Issues were made between the magistrates and people on the construction of the charter in reference to legislation and representation, the mode of voting was changed from the show of hands to the ballot, and a law against arbitrary taxation was passed; while from 1634 to 1644 a dispute continued concerning the relative powers of the assistants and deputies. That the sacrifices made by the Puritans to obtain religious freedom for themselves involved no recognition of the general principle of religious toleration, may be justly inferred from their conduct toward those who deviated from their ecclesiastical standard, of whom Roger Williams is the most conspicuous example. The Massachusetts colony for 4 years after their settlement had been left to bear their burdens and work out their own way without the interference of England. But the increasing emigration from the latter country,

and a suspicion on the part of the crown that the colony desired to be independent, led to an attempt to annul the charter, and the appointment of a special commission for its government, at the head of which was Archbishop Laud. The colony received an order, which they evaded, to deliver up their charter, and at a meeting of the general court measures were taken for the fortification of Boston harbor, Charlestown, and Dorchester, and arrangements made for drilling and disciplining troops. As to the threat of sending out a general governor, it was decided that "we ought not to accept him, but defend our lawful possessions, if we were able, otherwise to avoid or protract." The political agitations of the mother country preserved the colony from the dangers which threatened her from that quarter. A disturbance with the Pequots, in which Capt. Endicott burned two of their villages and destroyed their corn, led to the Pequot war (1687), the brunt of which was borne by the settlers in Connecticut, composed of those who had detached themselves from the parent colony. On the restoration of the Stuarts new troubles threatened Massachusetts. Its protest against the injustice of being subject to the laws of parliament, acquiesced in by the long parliament, was disregarded by the judges under the restoration, and it was declared to be under the legislative supremacy of parliament without restriction. The colony had addressed the king on his return, praying for the continuance of civil and religious liberties; and Leverett, the agent in London, was urged to support their application. Much controversy ensued, and at length in 1662 a commission sent to England obtained a confirmation of the charter from the king, and a conditional promise of an amnesty for all offences during the late troubles; but the king maintained his right to interfere in the domestic concerns of the colony, demanded the repeal of all laws derogatory to his authority, the taking of the oath of allegiance, the administration of justice in his name, the complete toleration of the church of England, and a concession of the elective franchise to every inhabitant possessing a competent estate. These demands did not excite opposition so much for themselves as for the further power they implied, and were strongly opposed by one portion of the community, while the other was willing to yield for the sake of quiet. Commissioners charged to investigate the affairs of the colony, and with "full authority to provide for the peace of the country, according to the royal instructions and their own discretion," arrived in 1664. To nullify the commission, Massachusetts published an order prohibiting complaints to the commissioners, and a remonstrance was addressed to the king. After an unsuccessful attempt to carry out the purposes of their mission, and frustrated in every effort by the vigilance of the colony, the commissioners went northward into Maine, but without effecting any thing of consequence, and were subsequent-

ly recalled. Massachusetts was reproved by the king, while Bellingham, the governor, and Hawthorne, beside 2 or 3 more to be appointed by the colony, were commanded to appear in England. Compliance with this command was after deliberation refused; and this bold act of disobedience, while it raised his anger, excited no further aggression on the part of a monarch who preferred the companionship of favorites and mistresses to the cares of state. The prosperity of the colonies received a severe check in the war with the Indians, called King Philip's war, which commenced in 1675. On the part of the savages the war was one of desperation; they burned villages, lay in ambush for stray parties, fell on defenceless outposts, and pursued the conflict in a spirit of the most sanguinary determination. During this war, which lasted till the latter part of 1676, and was terminated by the death of Philip, 12 or 18 towns were destroyed, more than 600 of the colonists perished in the field, and about 600 houses were burned. Of the men 1 in 20 had fallen, and of the families 1 in 20 was houseless, while the expenses reached the enormous sum for that day of \$500,000. Though the war had been conducted without assistance from England, it had hardly ceased when an emissary from that country, Edward Randolph, arrived. His pretensions were disallowed, and he returned to further excite the hostility against Massachusetts. A committee of the privy council, at the suit of Mason and Gorges, subsequently denied her right of jurisdiction over Maine and New Hampshire, which thus became separated; but through a private negotiation she purchased the title to Maine, which she retained until 1820. Notwithstanding many concessions, the colony failed to effect a reconciliation with the king. In 1684 the high court of chancery in England gave judgment for the crown against the governor and company of Massachusetts, and their charter was declared forfeited. Joseph Dudley was appointed president of Massachusetts, the general court dissolved, and the new commission superseded the government under the charter. On Dec. 20, 1686, Dudley was superseded by Sir Edmund Andros. The new governor and his council, in the most arbitrary and illegal manner, proceeded to make laws and levy taxes; and this tyrannous rule was submitted to, not, however, without protest and opposition, for more than two years. In April, 1689, reports having been received of the flight of James and the accession of William and Mary, on a rumor of an intended massacre by the governor's guards, the men of Boston, aided by others from the country, rose in arms, imprisoned Andros and others who were obnoxious, and reinstated the old magistrates. Next day crowds from the country came pouring in; the people took the castle and the frigate *Rose*, and occupied the fortifications; town meetings were held, representatives chosen, and the general court was restored. The same spirit prevailed at Plymouth; Clark, the agent

of Andros, was imprisoned, and Hinckley, the former governor, reinstated. Massachusetts took part in 1690 in the intercolonial war between the possessions of France and England. A fleet under Sir William Phipps captured and plundered Port Royal. An expedition to Canada failed, and the colony, being unable to pay the troops, issued treasury notes, the first paper money seen in the colonies. A new charter was given in 1692, by which Plymouth was united to Massachusetts, which had jurisdiction also over Maine and other territory. At this period Massachusetts contained a population of about 40,000. It was divided into the counties of Suffolk, Essex, Middlesex, and Hampshire, and comprised 55 towns. Plymouth, with a population of about 7,000, was divided into the counties of Plymouth, Bristol, and Barnstable, and comprised 17 towns. Under the new charter, the governor, lieutenant-governor, and secretary were appointed by the king. No act of the legislature was to be valid without the consent of the governor, and he had other important negative as well as positive powers. Sir William Phipps was appointed first governor. At about this period occurs an interesting and remarkable episode in the history of Massachusetts, the witchcraft delusion. (See SALEM.) In 1708-'4 the province suffered from the French and Indians, who among other injuries attacked and burned Deerfield, which had been rebuilt since King Philip's war. This war, in which the savages bore so conspicuous a part, lasted for several years, notwithstanding which the province continued to increase in strength and prosperity. In 1722 war was resumed with the Indians, and continued until the latter part of 1725, when the troubles with the Indians, which had now lasted upward of 40 years, were terminated. War having been declared between England and France in 1744, the colonial possessions were at once involved. Massachusetts contributed largely to the expedition which captured Louisbourg in 1745, and exerted her best energies in the plans for the conquest of Canada and other military operations until the conclusion of peace in 1748. The temper of the people toward all attempts upon their legal rights is illustrated by a tumult which occurred at this time in Boston, excited by the impressment of some merchant seamen and others for the king's squadron in 1747, and which seemed at one time to threaten serious results. The peace of 1748 did not last long. In a few years war again commenced, and the province once more gave her sons and her wealth to the cause of the parent country. Until 1760, when peace was restored in America, she actively participated in the conflict, which became for all the colonies a school in which their people were to be fitted to take part in a fast approaching and much more important struggle. By none of them were the oppressive measures of the English parliament, which precipitated the revolution, so strenuously resisted as by Massachusetts. She had a population of about 250,000, a large number of

vessels actively employed, and in many departments of industry was well advanced; and she had reached this position despite the oppressions of the mother country. Her course was now plain and decided; her ablest men uttered the boldest and truest sentiments, and her people responded to them enthusiastically. Meetings were held, resolves passed, principles enunciated, and a correspondence with the other colonies invited. These spontaneous expressions on the part of the people were not entirely sustained by the government of the colony. The general court addressed the house of commons in a tone much milder than the sentiments of the people desired. The passage of the stamp act aroused the wildest excitement, and its repeal the following year was welcomed with the most extravagant demonstrations of joy. Further plans for revenue were then proposed by the home government, which also refused to withdraw its troops. The arrival of the Romney man-of-war renewed the excitement, and Massachusetts issued another circular letter to the colonies, which the ministry in vain commanded them to rescind. The Boston massacre in 1770, the destruction of the tea in 1773, the port bill in 1774, are notable incidents preceding the revolution. The province was well represented in the general congress, and the men of Massachusetts were alive to every act of aggression. They took possession of the arsenal at Charlestown, and prepared themselves for the approaching struggle. The assembly adjourned to Concord, and organized as a provincial congress. At Lexington and Concord the issue was made, and Massachusetts for herself and in behalf of her sister colonies made the final appeal to arms. Throughout the revolutionary war Massachusetts sustained her former reputation for patriotism and public spirit, and the details of her history at this period will be found in this work embodied in the lives of her public men, and in the accounts of those places within her borders to which events have given historical interest. In 1780 a constitution was framed for the state, which was submitted to the vote of the people and adopted. By a clause in the bill of rights prefixed to it, slavery was soon decided to have been abolished. John Hancock was elected first governor. Six years later, in 1786, civil disturbances commenced in the centre and west of the state, caused by the poverty and distress of a great portion of the people, and the heavy taxes necessary to pay the state debt. An insurrection, known as Shays's rebellion from the name of its principal leader, Daniel Shays, broke out, and was not suppressed without bloodshed. The federal constitution was ratified by a state convention, which met in Boston, Jan. 9, 1788, and gave its assent by a vote of 187 to 168. After the formation of the government Massachusetts adhered generally to the federal party, and was foremost among the states opposed to the war with England in 1812, though she furnished great numbers of the seamen who manned

the navy by which the most brilliant successes of the war were won. In 1814 she sent delegates to the convention of the New England states which met at Hartford to confer upon the subject of their grievances, and to take such measures for relief as were "not repugnant to their obligations as members of the Union." Of that convention George Cabot of Massachusetts was president. In 1820 a convention to revise the constitution of the state met and proposed various amendments, 9 of which were ratified by the popular vote, and the rest rejected. In the same year the district of Maine was separated from Massachusetts, with the consent of the latter, and erected into a state. In 1857 amendments of the constitution were made, by which the district system of choosing representatives and senators to the state legislature was adopted in place of the apportionment by towns and counties.

MASSACHUSETTS BAY, a large body of water off the E. coast of Massachusetts, and included between Cape Cod on the S. and Cape Ann on the N., about 70 m. long by 25 m. wide. The name was originally applied to the waters of Boston bay only, but has been extended somewhat indefinitely, and now includes several other bays, among which is that of Cape Cod.

MASSAGETÆ, an ancient nomad people of Asia, who dwelt on the steppes adjoining the Jaxartes, or Sir Daria, and the sea of Aral, and according to some extended further to the S. E. They were regarded as Scythas, being probably of Turanian race, renowned as warlike, and distinguished by some strange peculiarities. Cyrus, the Persian conqueror, is said to have fallen in an expedition against them, when they were commanded by their queen Tomyris. Some critics identify them with the Meshech of the Scriptures.

MASSASOIT, a sachem of the Wampanoags, died in the latter part of 1661, at about 80 years of age. His dominions extended over nearly all the southern part of Massachusetts, from Cape Cod to Narraganset bay; but his tribe, once estimated at 30,000 in number, had shortly before the landing of the pilgrims at Plymouth been reduced by a disease, supposed to have been yellow fever, to barely 300. On March 22, 1621, a little more than 8 months after the founding of Plymouth, he appeared before the infant settlement with 60 of his warriors, armed and painted, for the purpose of forming a friendly league with the white men. Although the tribe were reputed to be cruel and treacherous, the open and friendly greeting of Massasoit so favorably impressed Gov. Carver, that after the necessary formalities were concluded, he formed in behalf of the colony a treaty of peace and mutual protection with the Wampanoags, which for 50 years was sacredly kept by both parties. The friendly disposition of Massasoit toward the colonists never relaxed. He lived within the limits of what is now the town of Warren, R. I., near an abundant spring which yet bears his name, where he

often entertained wandering pilgrims or administered to their necessities. Roger Williams, while on his way to Providence, was for several weeks his guest at this place. Massasoit was just, humane, and honest, never violating his word, and constantly endeavoring to imbue his people with a love of peace. In person, Morton says, in his "Memorial," he was "a portly man in his best years, grave of countenance, spare of speech." His second son, Pometacom, called by the colonists King Philip, who ultimately became sachem of the Wampanoags, was of a less placable disposition, and allowed the encroachments of the colonists to hurry him into the bloody contest known as King Philip's war.

MASSÉNA, a township of St. Lawrence co., N. Y., bordering on the St. Lawrence river; pop. in 1855, 2,701. The Grass and Racket rivers flow through the town. On the former are the villages of Massena and Massena Centre, at both which the river affords excellent water power; and on the latter are the Massena Springs. These are saline and sulphurous springs, at which there is a considerable summer attendance. There are several manufactories, a bank, and 2 printing offices. In 1855 there were 5 churches (1 Baptist, 2 Congregational, 1 Methodist Episcopal, and 1 Roman Catholic), and 1,227 pupils attending public schools.

MASSÉNA, *André*, a marshal of France, born in Nice, May 6, 1758, died in Paris, April 4, 1817. It has been said that he was of Hebrew origin, and that his real name was Manasseh. In early life he followed the sea, and subsequently entered the royal Italian regiment in the Sardinian service, in which he served 14 years, without, however, rising above the grade of sergeant. He subsequently returned to civil life; but upon the annexation of Nice to the French republic in 1792, he resumed the profession of arms, and was appointed adjutant major and soon after colonel of the regiment raised in the department of Var. By the end of 1798 he had attained the rank of general of division. His tactical skill in the Italian campaigns of 1794-'5 attracted the attention of Bonaparte, who, upon taking command of the army of Italy in 1796, committed to him the advanced guard. At Montenotte, Millesimo, Castiglione, Arcole, and Rivoli, Masséna distinguished himself; and so successful were all his movements on the battle field that Napoleon surnamed him the "favored child of victory." In Feb. 1798, he was sent to replace Berthier in the Papal States; but the appointment proving unpopular among the troops and the people on account of his character for rapacity and avarice, he soon resigned his command. In the succeeding campaign his operations against the allied Austrian and Russian armies in Switzerland were attended with brilliant success, and the decisive defeat inflicted by him on the Russian general Korsakoff at Zürich (Sept. 25, 1799) saved France from a threatened invasion. Directed by Bonaparte to defend Ge-

noa, which was invested by an Austrian army and blockaded by a British fleet under Lord Keith, he sustained a memorable siege of more than 3 months, and only surrendered when the inhabitants, reduced to desperation by hunger, threatened to rise against him. The concentration of a large Austrian force at this point, however, greatly aided Bonaparte in gaining the important battle of Marengo, fought 11 days after the capitulation of Genoa. Attached from interested motives to the republic, Masséna opposed the establishment of the empire; but his services were deemed by Napoleon too valuable to be dispensed with, and in 1804 he was created a marshal, an event which thenceforth attached him to the imperial cause. During the campaign of 1805 he commanded an army of 50,000 men in Italy, where by skilful manoeuvres he occupied the attention of the archduke Charles until Napoleon had gained the decisive victory of Austerlitz; and in the succeeding year he completed the conquest of Naples and established Joseph Bonaparte on the throne of that kingdom. In the campaign of 1809 he commanded the 4th corps of the grand army; and in the march down the Danube to Vienna, and particularly in the hard-fought battles of Aspern and Essling, where his valor and firmness saved the retreating French army from destruction, his services were of great importance. To his conduct in the latter engagement he owed the title of prince of Essling subsequently bestowed on him by Napoleon. At the battle of Wagram, where he commanded the left wing, he was obliged, in consequence of an injury recently received by a fall from his horse, to direct the movements of his troops from a carriage. Seeing his men waver at a critical moment of the day, he caused himself to be placed on horseback, and had scarcely changed his position when the vehicle was shattered by a cannon ball, which struck the very seat he had been occupying. In 1810 he was appointed chief in command of the army of Portugal, with orders to drive the British troops from the peninsula. Crossing the Mondego in the middle of September with 80,000 men, he followed Wellington to the neighborhood of Lisbon, where his progress was arrested by the famous lines of Torres Vedras. He accordingly fell back to Santarem on the Tagus, to await reinforcements from Soult, his army being insufficient to carry the position in which Wellington had fortified himself. But Soult was too fully occupied in the south of Spain to render him assistance, and Masséna, after lingering at Santarem until his army was greatly weakened by sickness and scarcity of supplies, commenced on March 5, 1811, his celebrated retreat into Spain, "in which," says Napier, "he displayed infinite ability, but withal a harsh and ruthless spirit." In the latter part of April he entered Salamanca, having lost 80,000 men within 6 months; on May 5 he fought the bloody but indecisive battle of Fuentes d'Onoro; and soon after he was obliged on account of ill health to

resign his command and return to France. During the whole campaign he had been a confirmed invalid, and to his inability to reconnoitre personally Napoleon ascribed the ill result of his operations, and particularly his failure to attack Wellington while entering the lines of Torres Vedras, and before the British troops were in position within the works. His subsequent military career was not remarkable, and after the restoration of his health he held the comparatively inactive post of commander of the 8th military division of the empire. He gave in his adherence to the Bourbons at the restoration, and during the Hundred Days took no part in public affairs.—In military capacity Masséna ranks with the first generals of the empire, although it was said of him that he never began to act with judgment until the battle was going against him, when his extraordinary coolness, confidence, and obstinacy frequently turned the scale in his favor. "On the report of the first cannon," says Napoleon, "his ideas acquired strength and clearness, and in the midst of the dying and the dead Masséna became himself." His private character was stained by imputations of meanness and rapacity, which took a definite form in a series of accusations brought against him by the inhabitants of Marseilles. Napoleon called him a "robber," and even offered him a present of 1,000,000 francs if he would discontinue his speculations, but without success. "Considering the circumstances of the times, however," adds the emperor, "he was precious, and had not his bright parts been soiled by the vice of avarice, he would have been a great man." He paid little attention to discipline or to the comfort of his troops, by whom he was cordially disliked. It deserves to be mentioned to his credit that, though on terms of enmity with Ney, he protested against the competency of the council of war which sentenced him to death.

MASSEY, GERALD, an English poet, born near Tring, Hertfordshire, in May, 1828. He was the child of a poor and illiterate couple, who lived in a hovel, and were barely able to feed and clothe their children. His whole education was confined to a few months at a penny school, where he learned to read and write; and at 8 years of age he was sent to work in a neighboring silk mill, his little weekly earnings, which never exceeded 1s. 8d., being deemed indispensable to eke out the subsistence of the family. From this unhealthy labor, which confined him 12 or 18 hours a day, he was released by the destruction of the mills; and soon after he was employed in straw plaiting—an occupation, if possible, more unwholesome than the other. Living in a marshy region and deprived of opportunities for exercise, the whole family were sometimes prostrated by agues, and their life became a constant struggle with want and misery. Young Massey nevertheless contrived to read whatever books were accessible to him, and at the age of 15, when he went to London to seek employment as an

errand boy, had made himself familiar with the Bible, the "Pilgrim's Progress," "Robinson Crusoe," and a few Wesleyan tracts. In the metropolis, while following his humble occupation, he read with avidity whatever came in his way, sitting up until 2 or 3 o'clock in the morning. At 17 years of age he fell in love, and under the influence of his passion felt the first impulses to poetical composition. "The first verses I ever made," he says, "were upon 'Hope,' when I was utterly hopeless; and after I had begun I never ceased for about 4 years, at the end of which time I rushed into print." Some of these early poems, dwelling upon the sufferings of the poor, and the "power of knowledge, virtue, and temperance to elevate them," appeared in the columns of a provincial journal; and subsequently a collection of them was published in his native town, Tring, under the title of "Poems and Chansons." The French revolution of 1848, by inducing him to look into the causes of poverty and misery and the anomalies of social life, and to view politics through the medium of such authors as Paine and Volney, "had the greatest effect on him of any circumstances connected with his life." Under the influence of the time, he started in conjunction with some fellow workingmen, in April, 1849, a cheap weekly newspaper called the "Spirit of Freedom," edited and half written by himself, and which became the vehicle of many articles from his pen of an ultra radical tone. His extreme political views, and the irregular life which his editorial duties imposed upon him, cost him 5 situations within 11 months. He however brought himself into some prominence among people of his class, and, by aiding the Rev. F. D. Maurice and the Rev. Charles Kingsley in their plans for cooperative labor by means of workingmen's associations, made a favorable impression upon those gentlemen. About the same time he married, and his poems, published occasionally in the London journals, began to attract notice. In 1853 appeared his "Ballad of Babe Christabel, with other Lyrical Poems," which passed through 5 editions within the next two years, and the favorable comments upon which by the chief critical authorities of the kingdom encouraged him to enter upon a literary career. With this object he removed to Edinburgh, where he has since resided. His latest volume of poems, entitled "Craigcrook Castle," appeared in 1856, and has, with his other poetical works, been republished in Boston (16mo., 1857).

MASSIE, NATHANIEL, an American pioneer, born in Goochland co., Va., Dec. 28, 1763, died in Ohio, Nov. 13, 1813. At the age of 17 he entered the revolutionary army, in which he served for a brief period; and he subsequently studied surveying. Uniting this occupation with that of locator of lands, he received ample employment from the large proprietors of western Virginia, and gradually became the owner of considerable tracts of wild land. In 1791 he located the first settlement within the

Virginia military district of Ohio, situated between the Scioto and Little Miami rivers, and between 1793 and 1796 he was engaged in an extensive series of surveys of the same region. In the latter year he laid out upon his own lands in the Scioto valley the town of Obilli-cothe. At the commencement of the present century he was one of the largest land owners in Ohio, became a member of the state senate, was elected a major-general of the militia, and in 1807 was a candidate for the office of governor. His competitor, Col. Meigs, who received a majority of the votes, having been decided to be ineligible on technical grounds, Massie was declared duly elected. Under the circumstances, however, he declined to accept the office, and retired to private life.

MASSIEU, JEAN, a deaf mute, born at Semens, now in the department of Gironde, France, in 1772, died in Lille in 1846. His parents were poor, and of their children 6 were congenital deaf mutes. At the age of 18 he was admitted into the school for deaf mutes at Bordeaux, then taught by the abbé Sicard. In 1790 or 1791 he accompanied the abbé to Paris, and about 1793 was appointed a tutor in the Paris institution for the deaf and dumb, where he continued till 1823, when, soon after the death of Sicard, he returned to Bordeaux, and, a year after, became the director of a school for deaf mutes at Rhodéz, department of Aveyron. A few years later he removed to Lille, where he established a school for deaf mutes, which was successful, and where he remained till his death.

MASSILLON, a town of Stark co., Ohio, on the left bank of the Tuscarawas, on the Ohio canal, and on the line of the Pittsburg, Fort Wayne, and Chicago railroad, 189 m. N. E. from Columbus, 259 N. E. from Cincinnati, and 80 m. S. from Cleveland; pop. estimated at 4,000. It is in the midst of a very productive country, and has an active trade in flour, grain, and wool. It contains 7 churches (Disciples', Episcopal, German Evangelical, Lutheran, Methodist, Presbyterian, and Roman Catholic), 2 banks, about 40 stores, 3 foundries, 8 machine shops, 1 woollen factory, and 2 newspaper offices.

MASSILLON, JEAN BAPTISTE, a French prelate and pulpit orator, born in Hyères, Provence, June 24, 1663, died Sept. 18, 1742. He studied with brilliant success under the Oratorians in his native city, and entered their congregation in 1681, his father having vainly tried to interest him in law. At first he conceived that both his talents and tastes disqualified him for the ministry, and he preferred to be a teacher of belles-lettres and theology; but his superiors overruled him. In the monastery of Sept Fonts he was appointed to reply to the charge of the cardinal de Noailles, which office he fulfilled with remarkable brilliancy and union; and from that time his talents and culture were directed toward the pulpit. He had been a professor successively at Pérzanas, Montbrison, and Vienne, and had gained distinction by several funeral orations, especially

by that delivered at Vienne on Henri de Villars, when in 1696 he was called to Paris to take charge of the seminary of St. Magloire. His sermons soon made him the rival of Bourdaloue, whom alone of contemporary preachers he admitted to be worthy of imitation. In 1698 he succeeded Bourdaloue in a mission to Montpellier. In 1699 he preached during Lent in the church of the Oratory at Paris, where Bourdaloue was one of his listeners; and delivered before the court at Versailles an advent sermon, which caused Louis XIV. to say to him: "I have heard many great orators, and been satisfied with them; but when you spoke, I was very dissatisfied with myself." His sermon on the small number of the elect was delivered for the first time at St. Eustache, and with so great effect that the entire audience rose during the peroration, "as if looking for the archangel to sound." This passage was selected by Voltaire, in the article *Eloquence* in the *Encyclopédie*, as presenting "the boldest figure and one of the finest strokes of eloquence to be found either in the ancients or moderns." In 1704 he preached a second time at court, and though Louis XIV. expressed his desire to hear him every two years, he was not again invited. He preached the funeral sermon of the prince of Conti in 1709; of the dauphin in 1710; and of the king in 1715. In 1717 he was appointed to the bishopric of Clermont, and was invited to preach during Lent before the young king. The 10 sermons, entitled *Petit carême*, which he composed for this occasion, are among his masterpieces, and are esteemed models of French prose and eloquence. From this time the orator gave place to the bishop, and he rarely left his diocese. In 1719 he was received into the French academy, and in 1723 he preached at St. Denis the funeral sermon of the duchess of Orleans, his last pulpit performance in Paris. He was noted for zeal, charity, and liberality, illustrated his precepts in his life, and delighted to unite Oratorians and Jesuits at his table, and to converse on topics of literature and art. As a preacher, he was called the Racine of the pulpit. Unlike Bourdaloue, who, as described by Mme. de Sévigné, "terrified his audience, striking blindly on every side, and impressing them with a feeling of *saute qui peut*," he excels in unction and tenderness, and charms by the elegance and grace of his style. As the tendencies of the 18th century began to manifest themselves, his eloquence, without ceasing to be that of a divine, became more and more that of a moralist and philosopher. His complete works have been published by his nephew (14 vols., 1745-'6), Renonard (18 vols., 1810), Beaucé (4 vols., 1817), Méquignon (15 vols., 1818), and Ohalandre (3 vols., 1847). His *éloge* before the academy was written by D'Alembert.

MASSINGER, PHILIP, an English dramatic poet, born in Salisbury in 1584, died in London, March 17, 1640. The son of one of the earl of Pembroke's retainers, he was probably edu-

cated in his native city, till in 1602 he was entered at St. Alban's hall, Oxford. There, according to Anthony à Wood, he occupied himself with poetry and romances instead of logic and philosophy, and left the university before receiving a degree, probably on account of the withdrawal of supplies by his patron, the earl of Pembroke. Gifford conjectures from some passages in his works that he became a Roman Catholic at Oxford, and was therefore alienated from his former friends. He repaired to London in 1606, and though he may have betaken himself immediately to dramatic composition, little is known of his life till the publication of his earliest drama, the "Virgin Martyr," in 1622. His name occurs in Henslowe's diary in 1614 in connection with two actors and dramatic authors, and from 1618 he was engaged as joint author with Fletcher, Field, and others. Most of his 18 extant plays were produced in the 10 years following 1622; the "Bashful Lover," the latest of them, was written in 1636. His health seems to have suffered from his laborious career, and his obscurity and lonely death appear from the register of his interment: "March 20, 1639-'40, buried Philip Massinger, a stranger." Five of his extant plays are tragedies, and the remainder belong to the serious drama, and may be termed tragi-comedies. His most striking excellences are in the conception of character, in dignity of sentiment, and in grace and melody of style. Less imaginative than others of the secondary dramatists, and deficient in comic powers, he is surpassed by none of them in refinement and in blending gentleness with noble daring in pictures of moral beauty. "Massinger, as a tragic writer," says Hallam, "appears to me second only to Shakespeare; in the higher comedy I can hardly think him inferior to Jonson. In wit and sprightly dialogue, as well as in knowledge of theatrical effect, he falls very much below Fletcher." The "Duke of Milan" is one of the best of his tragedies; "The Picture," "A Very Woman," "A City Madam," and "A New Way to Pay Old Debts," are among his best tragi-comedies. The last alone retains a place on the stage, for which it is indebted to its effective delineation of the character of Sir Giles Overreach. From political remarks in some of his plays it is inferred that he alone among the dramatists of his time did not accept the court doctrine of the divine right of kings. The best edition of his works is that by W. Gifford (London, 1805).

MASSON, DAVID, a Scottish author, born in Aberdeen in 1823. He was educated at Marischal college, Aberdeen, and at the university of Edinburgh, and at 19 commenced his literary career as the editor of a Scottish provincial newspaper. Two years later he went to London, and became a contributor to the magazines, subsequently spent several years in Edinburgh in a similar capacity, and about 1847 established himself again in London, where he has since chiefly resided. Since 1852 he has filled the

chair of English language and literature in University college, London. Of his numerous contributions to the "British Quarterly" and other reviews, a collection was published in 1856, entitled "Essays, Biographical and Critical, chiefly on English Poets." The article on Milton, included in this, has since been expanded into an elaborate life of the poet, of which the first volume appeared in 1859. Among other papers written by him are those on Carlyle's "Latter Day Pamphlets," "Dickens and Thackeray," "Rabelais," "Pre-Raphaelitism in Art and Literature," "Hugh Miller of Cromarty," "De Quincey and Prose Writing," &c. He is now (1860) the editor of "Macmillan's Magazine," established in Nov. 1859.

MASSOWAH, or MASSOUAH, a seaport town of Abyssinia, on an island in the Red sea, situated in the bay of Massowah, 250 m. N. E. from Gondar, and 450 m. N. W. from Aden; lat. 15° 36' N., long. 39° 21' E.; pop. about 8,000. The island on which it is situated is a barren rock about $\frac{1}{2}$ m. long, and from 800 to 400 yards broad. The harbor is deep, well sheltered, and safe, and can accommodate about 50 vessels. Owing to the nature of the island, the inhabitants have no water, save what they can collect in tanks. The island is held by the Turks. In 1859 the French acquired the port of Zula, about 25 m. S. of Massowah.

MASTER OF ARTS. See ARTS, DEGREES IN.

MASTER SINGERS, a class of minstrels, combining the qualities of poets and singers, who flourished in Germany during the 14th, 15th, and 16th centuries. They were generally of burgher extraction, and in the reign of the emperor Charles IV. were formed into regular corporations, which probably took their origin in the assemblage of minstrels and pupils which used to gather around Heinrich von Meissen, the *Frauenlob*, in Mentz, at the commencement of the 14th century. The seats of these corporations were the imperial cities, Nuremberg being the one in which they flourished most and which longest supported them, and a regular course of apprenticeship was necessary to insure admission to them. The compositions of the members, consisting chiefly of devotional and scriptural pieces, were subjected to a peculiar code of laws, and the chief faults to be avoided, 32 in number, were distinguished by particular names. At public contests in Nuremberg, a board of 4 judges, called *Merker*, having separate functions, sat to hear the poems recited or sung, and mark the faults in each. The first compared the recitation with the text of the Bible lying before him, the 2d criticized the prosody, the 3d the rhymes, and the 4th the tunes. He who had the fewest marks received the prize, and the successful competitors were thereupon permitted to receive apprentices. These corporations began to decline in the 17th century, and are now extinct, that of Ulm in 1839 being the last, and have been succeeded in modern times by the *Liederkränze*, *Sängerbünde*, and other forms of singing societies. The most famous master

singers were Hans Sachs, the Nuremberg cobbler, Muscatblut, Michael Behaim, and Hadlaub.

MASTIC (Gr. *μαστιχη*, from *μασσαι*, to chew or eat, so named from the practice of chewing the substance which prevailed formerly as at present in Greece), a resinous exudation obtained from the bark of the *pistacia lentiscus*, a shrub about 12 feet high, found upon the borders of the upper Mediterranean. The drug is obtained chiefly from the island of Scio or Chios in the Grecian archipelago. It was known to the ancients, being correctly described by Dioscorides and Pliny, and that from Chios being particularly recommended by Galen. It is collected during the month of July or August, when the juice slowly exuding from the tree hardens in tears on the bark, or on cloth placed to receive it, or falls upon the ground. The tears are of superior quality, of various sizes, pale yellow color, semi-transparent, roundish, oval, or flattened in form, and brittle in fracture. These are called picked mastic. The more ordinary kind, termed mastic in sorts, is obtained in irregular masses, mixed with bark, sand, and other impurities. Mastic has but little odor or taste. Alcohol dissolves about $\frac{1}{4}$ of it, leaving a copal-like substance. Chloroform, ether, and oil of turpentine are its proper solvents. By the inhabitants of the countries from which it is procured mastic is considered highly efficacious in purifying the breath and preserving the teeth, and it is extensively used for these purposes by the Turkish ladies. It is friable when first put into the mouth, but by chewing becomes soft, and assumes an opaque appearance. It is sometimes used for filling decayed teeth. Dissolved in spirits of wine or oil of turpentine, it makes an excellent varnish. A varnish much esteemed by microscopists is made by macerating half an ounce of mastic and 15 grains of caoutchouc in 2 fluid ounces of chloroform, and filtering in close vessels.

MASTIFF (*canis urcanus*), a variety of the dog family, large and powerful, with truncated muzzle and elevated skull, strong neck, muscular back, and robust limbs; the condyles of the lower jaw are above the line of the upper molars; the head is large, with the ears small and partly drooping; the tail truncated and carried erect; there is occasionally a 5th hind toe. The character of the mastiff seems to spring from a consciousness of power; it is calm, dignified, courageous, not easily irritated, but when angry a most determined and fierce assailant; not abundant anywhere, nowhere found wild, it is rather the independent associate than the servant of man; it is not disposed to form cross breeds. The supposed wild originals inhabited high mountain ranges in the temperate parts of the eastern hemisphere; if we seek for the original where the race is now the most numerous and in the highest perfection, it would be in the mountains of Thibet, though there exists no similar wild animal in that region; the nearest wild type is the *lycaon* of the Cape of Good Hope (see HYÆNA), which possesses many of

the characteristics of the mastiffs, and is probably nearly allied to a northern congener now domesticated and not hitherto known in a wild state; the hair in both is short and shaggy, never like the long and thick fur of the wolf-like dogs. The mastiff form became known to the Greeks about the time of the Macedonian conquest, and the classic Roman writers describe the pendulous lips, fiery eyes, loose folds of skin above the brows, and other characters of the modern mastiff of Thibet. The color of the Asiatic breed is generally very dark, almost black, with a few tan-colored spots about the face and limbs. The mastiff of Thibet is the largest and finest of the breed, and extends through S. and E. Tartary. The English mastiff, perhaps derived from this, but smaller and somewhat crossed with the stag and blood hounds, is more elegant in form and more majestic; the color is usually dark buff, with dark muzzle and ears; one mentioned by Hamilton Smith measured 29½ inches in height at the shoulder, and others are described as daring to engage singly with the lion, and able to cope with the bear and leopard. The mastiffs seem to have an idea of property, and make on this account most excellent watch dogs; they have a strong but not obtrusive attachment to their masters; their sense of smell is inferior to that of the hunting dogs, but their voice is singularly deep and musical; the stories of their sagacity are given in many popular works. On the continent of Europe they are generally white, with large clouds of black or reddish; they have been seen 80 inches high at the shoulder.

MASTODON (Gr. *mastor*, nipple, and *odous*, tooth), an extinct proboscidean pachyderm, coming near the elephant, found either in the tertiary or more recent deposits in all quarters of the globe except Africa. This animal has the vaulted and cellular skull of the elephant, with large tusks in the upper jaw, and heavy form; from the characters of the nasal bones and the shortness of the head and neck, it has been concluded that it had a trunk; the crowns of the molars are divided by transverse rows of mammillary conical prominences, whence the name; beside the upper incisors or tusks, the cheek teeth are $\frac{3}{2}$, succeeding each other from behind forward, as in the elephant, only 2 or 3 being in use at a time; during youth there were 2 short and straight tusks at the end of the lower jaw in the males, which were retained sometimes to adult life. The best known species is the North American mastodon (*M. giganteus*, Cuv., or *M. Ohioticus* of Falconer); this has been fully described in a superb work by the late Dr. John C. Warren, assisted by Dr. J. F. W. Lane ("The Mastodon Giganteus of North America," 2d ed., 4to., Boston, 1855), to which the reader is referred for the fullest details and abundant illustrations of most of the species. A few remains of the mastodon had been discovered in North America as early as 1708, but it was not until 1801 that any thing like a complete skeleton was obtained, when a tolerably

complete one was procured from the morasses of Orange co., N. Y.; this was carried to London in 1802, but was soon returned to this country, where it occupied a prominent place in Peale's museum at Philadelphia until 1849 or 1850, when it suddenly disappeared; it was imperfect, wanting a considerable part of the head, some vertebrae, ribs, and bones of the limbs; it was believed by Dr. Warren to have fallen into the possession of Prof. Kaup of Darmstadt, Germany. Another skeleton, less perfect than the last, obtained at about the same time, was exhibited in Baltimore for years, and in a dismounted state came into the possession of Dr. Warren of Boston in 1848, where it still remains. About 1840 Mr. Koch procured a rich collection of mastodon bones from the banks of the Missouri, and put together a nondescript animal, the so called *Missourium*, which drew crowds of visitors in New York and London, until from the mass of bones of several individuals a tolerably complete skeleton was made up by Prof. Owen, which is now in the British museum. The skeleton now at Cambridge, Mass., was discovered in Warren co., N. J., in 1844; with this young female were found 4 very perfect heads, a number of fine teeth, and several bones. The finest of the skeletons of this species is the one described by Dr. Warren in the work above mentioned; it was discovered at Newburg, N. Y., in 1845, in a swamp usually covered with water, but left dry during that summer; it is now in the city of Boston. Specimens have been found in the states of New York, Kentucky, Alabama, Mississippi, Missouri, Kansas, Texas, and as far as lat. 65° N. Taking Dr. Warren's specimen as the type of this species, the cranium is flatter than in the elephant, narrow between the temporal fossae, the face becoming twice as wide below the nasal opening; the length of the superior surface, from the vertex to the edge of the premaxillary bones, is 48 inches, and the width between the superior orbital processes 28 inches; the posterior or occipital surface is nearly vertical, roughened for muscular attachments; the temporal fossae are of great size, indicating the power of the muscles which filled them; the zygomatic processes thick and strong; lower jaw V-shaped, the anterior pointed extremity having on the internal surface a long wide groove for the tongue. The cervical vertebrae have short spinous processes, except the last, which is 6½ inches long; the dorsals are 20, and, with the 8 lumbar, form a considerable arch, the first 7 having very long spinous processes (that of the 8d, the longest, being 23½ inches), and thence gradually diminishing to the last, which is only 4 inches; the transverse processes are also very thick in the first 7; the 1st lumbar measures across the transverse processes 17 inches, of which the body is only 5; the sacrum consists of 5 bones, and is 20 inches long on the lower surface; caudals probably about 22, very strong at the commencement of the tail, which reached to the knees. The pelvis is very strong and mas-

sive, $6\frac{1}{2}$ feet wide across the anterior superior spinous processes; thorax rounded, its anterior opening 2 feet from above downward and 1 foot transversely; sternum keeled below, with a stout pointed protuberance in front. The ribs are 20, 18 true and 7 false, the 1st nearly vertical and resembling a clavicle, and 28 inches long; from this the ribs increase to the 9th, which is $54\frac{1}{2}$ inches, and thence decrease to the last, which is 21 inches; the 5th, flat anteriorly, is 4 inches wide; after the 7th they become rounded; they are not unfrequently found united, as after fracture. The scapula is more nearly equilateral and in this respect more human than in the elephant, and like some of the other bones might in rude ages be easily mistaken for the remains of giant men; its spine is nearly vertical, bifurcating below, the infra-spinous fossa more than 8 times as ample as the supra-spinous, the former having generally a depression near the spine; the glenoid cavity is 11 by 5 inches. The massive humerus is 39 inches long, and the same in its greatest circumference, with a remarkable projection extending $\frac{1}{2}$ down the limb for the deltoid muscle; the circumference of the elbow joint is 44 inches; radius 29 inches long and $6\frac{1}{2}$ wide below; the ulna much the stoutest, and 34 inches long. The fore foot measures nearly 2 feet across; the wrist has 8 bones, in 2 rows of 4 each; metacarpals 5, the 1st or thumb the smallest (4 inches long), the 2d and 4th 5 inches, the 3d (the largest) $6\frac{1}{2}$, and the 5th about $4\frac{1}{2}$; phalanges in thumb 2, and in the others 3 each, supposing an ungual phalanx to be present in all, though wanting in the skeleton. The thigh bone is massive and about as long as the humerus, 17 inches in circumference at the middle and 30 at the lower portion; the knee pan nearly globular; tibia human-like, 28 inches long, 30 inches in circumference above and $18\frac{1}{2}$ in the middle; fibula 26 inches, ascending less high than the tibia, but descending lower to form the external malleolus; feet more depressed, and the toes more radiating, otherwise much as in the elephant. This skeleton is 11 feet high, 17 feet from end of face to beginning of tail, the latter being $6\frac{1}{2}$ feet; circumference around ribs 16 feet 5 inches; tusks about 11 feet, of which $8\frac{1}{2}$ project beyond the sockets. The teeth consist chiefly of dentine invested by enamel, though a layer of cement, thinner than in the elephant, invests the fangs and is spread over the crown. The whole number of teeth is 24, of which rarely more than 8 are in use at one time; they are developed from behind forward in order to relieve the jaws from the excessive weight of the whole at one time; the outer edge of the upper teeth projects beyond that of the lower. Two on each side in each jaw are developed soon after birth, and are shed early. In the lower jaw, the 1st is small, $1\frac{1}{2}$ by $\frac{1}{4}$ of an inch, and $\frac{1}{4}$ of an inch high, with 2 transverse bifid ridges slightly notched, and 2 projecting much curved fangs; the 2d, immediately behind it, has the same characters, but is larger, $1\frac{1}{2}$ by $1\frac{1}{2}$ inches,

and $1\frac{1}{2}$ inches high, with a prominent heel; the 3d is 8-ridged and 6-pointed, 8 by 2 inches, and $1\frac{1}{2}$ high; the 4th is $8\frac{1}{2}$ by $2\frac{1}{2}$, and $1\frac{1}{2}$ inches high, with the inner mastoid eminence notched; the 5th is $4\frac{1}{2}$ by 3 inches, with the inner points notched; the 6th is 4-ridged, with complex heel and deeper cleft furrows, 8 by 3 inches, and $6\frac{1}{2}$ high; the last sometimes has 5 ridges. The 1st and 2d of the upper jaw resemble those of the lower; the 3d is 8-ridged, $2\frac{1}{2}$ by 2 inches; the 4th is 8-ridged, 8 by $2\frac{1}{2}$ inches (and sometimes much wider), with the eminences notched; the 5th is also 8-ridged, 4 by 3 inches, each with 2 eminences; the 6th is 4-ridged, with a small heel, the points sometimes bifurcated, and the furrows deep, $6\frac{1}{2}$ by 8 inches, sometimes larger, even to $9\frac{1}{2}$ by $5\frac{1}{2}$, and with 5 ridges. There is no evidence of an additional premolar under the 2d lower milk tooth, though there may be such in the upper jaw, as in other species of mastodon and in the tapir. At an advanced age the 6th tooth remains alone on each side above and below; in a case mentioned by Dr. Warren there was a 7th or supernumerary tooth on one side of the lower jaw, 7 inches long and $7\frac{1}{2}$ high. Beside the upper tusks, there are in the mastodon, though not in the elephant, inferior mandibular tusks. Whether the narrow-toothed mastodon existed in North America must be decided by the origin to be attributed to the so called "Baltimore tooth," said to have been found in Maryland. The food of the mastodon was entirely vegetable, as is proved by the remains of the twigs of coniferous trees, leaves, and other vegetable matter found between the ribs; and the animal doubtless was fond of resorting to marshy and boggy places, like other pachyderms, in search of succulent plants, where it was often mired in the very places whence its remains have been extracted during the 19th century. Around the Shawan-gunk skeleton were found tufts of hair of a dun-brown color, varying in length from 2 to 7 inches; so that the mastodon, like the Siberian mammoth, may have been clothed to withstand a climate considerably colder than those in which modern elephants live. The bones of *M. giganteus* have not been generally found in a mineralized state; in Dr. Warren's specimen the bones are light-colored, of less specific gravity than recent bones, and retain from 27 to 30 per cent. of animal matter (bone cartilage); both bones and teeth, however, have been found silicified, and they are generally impregnated with iron, which it is well known has a great preserving power.—The geological position of the remains of this species has long been and still is a subject of dispute among geologists; in a few instances they are said to have been found below the drift, in the pliocene, and even in the miocene; but they have generally been obtained from the post-pliocene or alluvial formations at a depth of from 5 to 10 feet, in lacustrine deposits, bogs, and beds of infusorial earth; Pomel and others consider them diluvial; the bones of this mastodon and of the fossil ele-

phant have been found in company in Ohio, South Carolina, Texas, the pliocene of Nebraska, and various other parts of North America. Some have thought that the mastodons became extinct since the advent of man upon the earth, like the *dinornis* and the dodo; according to Lyell, the period of their destruction, though geologically modern, must have been many thousand years ago. The same causes probably acted in their extinction as in the case of the fossil elephant, perhaps partly climatic changes, or more probably some great convulsion on the surface of the globe at an epoch anterior to man.—About 80 species of mastodon have been described, for details on which see the work of Dr. Warren and those referred to by him. In South America lived the *M. Humboldtii* (De Blainv.), belonging to the narrow-toothed group, of which the European *M. angustidens* is the type; this is characterized by the shorter rostrated extremity of the lower jaw, the apparent absence of lower tusks, and folds of enamel more complicated than in the teeth of *M. giganteus*. *M. Andium* (Ouv.), a smaller species, considered by D'Orbigny the same as the last, had the same undulating folds of enamel, but a more elongated symphysis. The distinction between the *M. longirostris* (Kaup) and the *M. angustidens* (Ouv.) of Europe is not well made out, and authors differ exceedingly as to the limits of these species. The division of Pomel seems as probable as any; he describes as *M. longirostris* (or *arvernensis*, Cr. and Job.) those having a lengthened lower jaw, 4 ridges in the 8d, 4th, and 5th teeth, 5 and sometimes 6 in the ultimate molar, tusks in the lower jaw, and a vertical upper premolar; the *M. angustidens* he limits to the Italian species, with the same narrow teeth and 4 ridges in the 8 penultimate molars, with no beak to the lower jaw as in *M. longirostris*, or short truncated gutter as in *M. giganteus*, but with a long horizontal semi-canine slightly inclined downward; the bones, according to De Blainville, resemble more those of the Asiatic elephant than the American mastodon; Dr. Falconer, on the contrary, considers the *M. angustidens* and *longirostris* as perfectly distinct, and the former as more nearly related by a 8-ridged penultimate molar to the *M. giganteus* than to the *M. longirostris*, placing the 1st 2 in the section *trilophodon* (with 8 ridges), and the last with the Asiatic species in the section *tetralophodon* (with 4 ridges to the 8d, 4th, and 5th molars). The famous Dussina mastodon (*M. Turicensis*), discovered near Turin in 1849 in a fluvio-lacustrine deposit, described by Prof. Sismonda, whose description is partially reproduced with a figure in Dr. Warren's work, belonged to the *M. angustidens*; in the same deposit were found remains of elephants and other large pachyderms. Pomel's other species, less clearly made out, are *M. Cuvieri*, with a prolonged lower jaw and the 8 penultimate molars with 3 ridges; *M. tapiroides*, with tuberculated teeth, forming a connecting link with those of the *dinotherium* (both of the last are found in

central and southern France, the *M. longirostris* having been found in central Germany, at Eppelsheim); and the *M. Buffonis*, with short thick teeth, to which he refers the Siberian specimens. The age of the European mastodons was earlier than that of the American, their remains having been found as low as the miocene, and probably long anterior to the elephant, which was a contemporary of the American mastodon; according to Pomel, *M. angustidens* is found with *M. Buffonis* in pliocene, and *M. Cuvieri* and *tapiroides* in miocene lacustrine deposits; but at Turin bones of the elephant, rhinoceros, hippopotamus, and tapir were found with the Dussina specimen, so that the fossil elephant of the old world would seem to have been anterior to that of the new. Pictet describes also *M. brevirostris* (Gervais), from the pliocene of the south of France, with the lower jaw short as in elephants, the lower tusks not at all or slightly developed, and the molars as in *M. longirostris*, with secondary tubercles between the ridges; he mentions other species as found in the pliocene of Puy and Auvergne. Two species found in Asia may be mentioned here in conclusion—the *M. Sivalensis* (Falc. and Cautl.), from the Sivalik hills, and the *M. latidens* (Clift), from the banks of the Irrawaddy; in the former the teeth are of very large size, the ultimate molars being from 8 to 9½ by 8 to 8½ inches, with 6 ridges in the upper jaw, rounded mamillæ, and rather narrow form; in the latter the form is broader, and the teeth sometimes with as many as 10 ridges, and seemingly one of the links connecting mastodon with elephant; these belong to the section *tetralophodon*. The specific name of *tetrucaulodon* given by Dr. Godman to some mastodon specimens, from their having 2 tusks in the lower jaw, is now generally admitted to be ill-founded; lower tusks are found in young males of many species, and sometimes one or both in the adult male, their presence being probably a sexual and not a specific character. Dr. Leidy and others have indicated several species of mastodon in Kansas and Nebraska, and other newly explored regions of North America; these are described in the "Proceedings" of the Philadelphia academy of natural sciences during the last 3 years.—According to Owen, the mastodons were elephants with molars less complex in structure and adapted for coarser vegetable food, ranging in time from the miocene to the upper pliocene, and in space throughout the tropical and temperate latitudes. The transition from the mastodon to the elephant type of dentition is very gradual.

MASTODONSAURUS. See LABYRINTHODON.

MASUDI, ABUL-HASAN 'ALI BEN HUSKIN BEN ALI, an Arabian scholar and author, born, according to his own statement, in Bagdad, near the close of the 8d century of the hegira, died probably in Cairo in A. H. 845 (A. D. 956). He belonged to a family illustrious from the time of Mohammed. From childhood he exhibited remarkable talents and fondness for

study, and made immense acquirements in philosophy, literature, geography, and history, attaining a universality of erudition which has been equalled by no other Arab. He was not only familiar with all that concerned the Arabs, but with the history of the Greeks and Romans and of the oriental nations, both ancient and modern, with the religious opinions of the Jews, Christians, heretics, Mohammedans, and barbarous idolaters, and with the systems of Zoroaster and Confucius. On some important questions he expressed ingenious and novel views, which were in advance of his successors for several centuries. Not content with the information contained in books, he undertook several long journeys. About 914 he visited the ancient Persepolis, and passed thence to India, Ceylon, the coast of China, Madagascar, and southern Arabia, and explored the region of the Caspian sea. In 925 he was in Palestine, and he subsequently dwelt in Syria and in Egypt. He says that he travelled so far to the east that he forgot the west, and so far to the west that he forgot the east. His most important work is the *Akhbar-al-zeaman*, or "History of the Times," an immense general history, which has never been printed; no copy of it exists in Europe. His second work, entitled *Kitabal-awsat*, or "Book of the Middle," treated curious questions in history, geography, philosophy, and the sciences; but copies of it are very rare, and unknown in Europe. Perceiving that these works were too voluminous to be popular, he wrote a history of smaller compass, entitled *Morudjal-dheheboo-maadinal-djeddhir*, or "Meadows of Gold and Mines of Gems," which is not rare in the libraries of Europe. Its translation into English by the oriental translation fund was undertaken, but only the first volume, by Dr. Aloys Sprenger, with the cooperation of the earl of Munster, has been issued (London, 1841). He is the author of a variety of other works on religion, morals, medicine, and the sciences, some of which are extant in manuscript, and others are known only by their titles.

MAT, a coarse fabric made by interweaving strips of the inner bark of trees, flags, rushes, straw, grass, ratans, or similar materials, and used for covering floors, for beds, sails, packing of furniture and goods, and a variety of other purposes. In Paris mats were commonly employed as tapestry for lining the walls of rooms till some time in the last century. They serve among rude nations as a substitute for wooden doors and glass windows. By gardeners they are employed to protect delicate plants from frost, and are very convenient in conservatories for keeping out the cold. Mats are supposed to be the first fabrics that were woven by man; and almost all savage tribes now possess considerable skill in their manufacture. In W. Africa pieces of fine mats have served as money and as standards of value for other commodities. The grass mats of the South sea islanders are often of great beauty for their fineness and the brilliant

colors of their dyes. The Japanese cultivate a peculiar species of rush for making mats, and the softness and elasticity of these well adapt them for beds or floor coverings. The Chinese make ratan floor mats of any sizes, but chiefly about 7 feet by 5; also rush floor mats, and table mats of ratans and rushes, all of which are exported to other countries. In Europe, mats from reeds and rushes are largely produced in Spain and Portugal; but in Russia the manufacture is a prominent branch of national industry. The material there employed is the bark of the lime or linden tree, and the mats are known in Europe as "bast" mats. In the governments of Viatka, Kostroma, and those adjoining, the villages are said to be almost deserted during the months of May and June, the whole population being in the woods stripping the trees. The peasants make the bark into shoes, cordage, sacks for grain, and matting for many purposes. It is largely exported from Archangel, the shipments in 1851 and 1852 averaging 615,860 pieces per year. It is also sent abroad from St. Petersburg, Riga, and other ports, and is very largely used for packing articles of Russian produce. In view of the immense production of this matting, which according to a Russian authority amounted in 8 of the governments of northern Russia to 14,000,000 pieces yearly, fears have been entertained that the linden tree would be entirely destroyed; but the mats continue as abundant and cheap as ever.

MATAGORDA, a S. E. co. of Texas, bordering on the gulf of Mexico and Matagorda bay, intersected by the Colorado river and Caney creek; area, 1,200 sq. m.; pop. in 1850, 2,124, of whom 1,208 were slaves. The soil of the Colorado and Caney bottoms is deep and rich, equally well adapted for the cultivation of sugar and cotton. West of the Colorado are large prairies with light sandy soil clothed with luxuriant pasture. Timber (mostly oak, cedar, pecan, and hackberry) is confined to the banks of the streams. The productions in 1850 were 108,860 bushels of Indian corn, 39,400 of sweet potatoes, 1,394 hhds. of sugar, and 1,618 bales of cotton. Aggregate value of taxable property in 1859, \$2,506,280.—**MATAGORDA**, capital of the above county, is situated a short distance E. of the Colorado, near Matagorda bay, upon the high prairie, 80 m. from Galveston; present white pop. estimated at 1,200. It has considerable trade in cotton, sugar, rice, corn, &c., receiving the produce of the fertile Colorado valley. It contains a number of stores, 2 churches, and an academy. A lighthouse has been erected. A great storm in Sept. 1854, nearly destroyed the town, blowing down most of the houses; but it has been since rebuilt in an improved style.

MATAMORAS, a town of Tamaulipas, Mexico, on the S. bank of the Rio Grande, 40 m. W. from the gulf of Mexico; pop. 20,000. On the gulf it has 2 harbors, the Brazo de Santiago and the Boca del Rio, about 9 m. apart, with bars passable only in moderate weather. It is

well built, and contains several churches, convents, and schools. It exports specie, hides, wool, and horses, and imports chiefly manufactured goods from Great Britain and the United States. During the war with the United States it was occupied by the American troops.

MATANZAS, a fortified maritime town of Cuba, on the N. W. coast of the island and on the San Juan river, 52 m. E. from Havana; pop. 27,000. The principal edifices are the castle, churches, hospital, theatre, library, and barracks. The harbor is spacious and well sheltered, save toward the N. E.; and the surrounding territory is one of the richest districts in Cuba. In 1858, 878 vessels from and to the United States entered and cleared the port of Matanzas.

MATAPAN, CAPE, the southernmost extremity of Greece. (See **TENARUM**.)

MATARO, a seaport of Spain, in the province of Barcelona, 17½ m. by railway (the first built in Spain) E. N. E. from the city of Barcelona; pop. about 15,000. It is situated on the Mediterranean shore, and partly on the declivity of a hill. Linen, cotton, woollen, silk, leather, &c., are manufactured. Mataro has no harbor, and most of its trade passes through Barcelona.

MATCH, a small stick of combustible material furnished with some very inflammable composition, and used for producing fire. Among rude nations fire was obtained by rubbing together two pieces of dried wood; and the practice among civilized people has been to procure it by the flint and steel, catching the particle of steel struck off and rendered red-hot by the friction in dry and highly inflammable tinder. To this succeeded the use of phosphorus, which in 1680, a few years after its first discovery, was introduced for this purpose in London by Godfrey Hanckwitz, who applied it by rubbing it between folds of brown paper till it took fire; it was then made to ignite a stick, one end of which had been dipped in sulphur, and which may be considered the earliest form of the common match. The cost of the phosphorus, however, prevented its general use either in this form or in several others contrived for the same purpose. One of the most successful of these was to partially burn a bit of phosphorus in the confined air of a small vial, the effect of which was to line it with the oxide of phosphorus; the vial was then corked, and when required for use a sulphur match was dipped into it; the match was thus ignited by the chemical action produced, or by afterward rubbing it upon a piece of cork. Another form extensively used were called chemical matches, and were sold in little cases called phosphorus boxes, containing a few matches, at first as high as 15s. each box. They were small sticks of wood dipped first in sulphur, and then in a composition of chlorate of potash, flowers of sulphur, colophony, gum or sugar, and cinnabar for coloring. Accompanying them in the box was a vial containing sulphuric acid, into which the match being dipped, it was instantly ignited by the

chemical action induced between the acid and chlorate of potash. The other ingredients were added merely on account of their combustible qualities. To this succeeded, in 1829, the use of the lucifer match, invented by Mr. John Walker, chemist, at Stockton-upon-Tees. In his experiments upon chlorate of potash, he found that this could be instantly ignited by friction, as in drawing a stick coated with it quickly through folded sand-paper. The salt was made to adhere to wood already coated with sulphur, by dipping this in an emulsion prepared with mucilage, of either phosphorus or sulphuret of antimony and chlorate of potash. The other inflammable ingredients served to retain the fire and communicate it to the wood. Mr. Walker manufactured but few of these matches for use in his neighborhood. Prof. Faraday, learning of them, procured some, and brought them into public notice. Their useful properties were soon perceived, and their manufacture rapidly increased, till it became an important branch of industry in Europe and the United States, furnishing employment to large numbers of men, women, and children. The chief objection to the preparation was the noise produced in igniting the match. This was afterward obviated by the substitution of nitre or saltpetre for the chlorate of potash, and the disagreeable smell of the burning sulphur was diminished by replacing a part of this substance with stearine. The best wood for matches is clear white pine, which possesses the softness required for the manufacturing process, together with the necessary stiffness and inflammability; and the quantity of this consumed in their manufacture is enormous. The wood is first sawed into blocks of uniform size, and the length of two matches. By machines of ingenious construction, these are afterward slit without loss of material into splints, which being collected into bundles and tied are dipped into the composition, first one end and then the other. Another string is then fastened round them, after which they are cut across between the two strings by a circular saw which divides them in the middle. Round matches are formed by forcing the wood endwise through holes in plates, which in the English works are an inch thick, with steel face and bell-metal back. In American establishments tubes are employed whether for round or square splints. The perforations are made as near together as possible, only leaving enough of the metal between to give the necessary strength for cutting. This invention was patented in England in 1842. —The acid fumes thrown off from the phosphorus in the various processes of making matches frequently cause among the people employed a terrible disease which attacks the teeth and jaws; and to such an alarming extent did it prevail in Germany, that the attention of the government was called to it. The dippers are most liable to suffer in this way, in consequence of standing for hours over the heated slab upon which the phosphorus is spread. As

those persons with decayed teeth are most susceptible to the disease, they are carefully excluded from some manufactories. No antidote has as yet been discovered to this terrible disease. Its natural course is to rot the entire jaw bone away. This generally occupies several years with a steady discharge of matter outside and into the mouth. The pain is not very acute, but is constant, and the sufferer seldom survives the natural course of this disease. Many operations have been performed, chiefly by Dr. Mott at the New York hospital. In some cases the entire jaw bone, and in others only one half or one side of the jaw, has been removed. By this process the disease is arrested, and the patients generally recover. Thorough ventilation and careful attention to cleanliness have been found the most effectual preventives. (See PHOSPHORUS.)—It is a fact worthy of notice that, insignificant as matches are, it is a matter of importance, on account of the immense numbers made, that the manufactories should be situated in districts where timber is cheap. One manufacturer in Herkimer co., N. Y., is said to have consumed within the last 18 years 2,225,000 feet of lumber, producing 6,500,000,000 matches. Probably the largest manufacturer in the United States is Mr. Charles Partridge of New York. His works, for the sake of abundant supplies of material, are in the wooded district of Lewis co., N. Y., near the Black River canal. Beside the wood employed for the splints, large quantities are also consumed for the small cylindrical boxes in which the matches are transported. Some of the splints are exported to the West Indies and South America, where the manufacture of matches has been established within a few years past. The matches themselves are largely exported to the East and West Indies, Australia, China, Mexico, South America, the Pacific coast, &c. The total amount manufactured in the United States is estimated at 7,000 gross of boxes daily, containing 35,700,000 matches, and worth \$3,000.

MATE, or PARAGUAY TEA. See HOLLY.

MATERIA MEDICA. See MEDICINE.

MATHEMATICS (Gr. *μαθημα*, or *μαθησις*, learning), the science of quantities; or more precisely, the science which has for its object the determination of unknown from known quantities, by means of the relations existing between them. It is defined by Kant as the science of the laws of space and time, since it treats of the quantities occupying space and time, and representable by diagrams, numbers, or symbols. Space is boundless extension; time is endless succession. The former embraces matter; the latter, motion. Mathematics gives and applies the laws of both.—The science is distinguished as pure or mixed mathematics, according as it treats of laws and relations *in abstracto*, with reference to nothing actual, or *in concreto*, with reference to existing phenomena. The former, dealing with abstract quantity, does not imply the idea of matter; the latter, dealing with concrete quantity, embraces

the actual material world. The former gives the absolute forms of the universe; the latter, their illustrations by real examples. The elements employed by the former are self-evident principles, suggested or immediately grasped by the reason itself; the latter applies these principles to natural objects, the properties of which must be learned by induction from experience. The former treats of possible, the latter of actual magnitudes.—The branches of pure mathematics are arithmetic, geometry, algebra, analytical geometry, and the differential and integral calculus. Arithmetic is the science and art of numbers. It does not calculate functions or relations, but special values in every case. Its single elementary idea is one or unity, from which all other numerical values, integer or fractional, are formed. The processes of arithmetic lie at the basis of all others. Geometry measures extension, comparing portions of space with each other. Its elements are not numbers, but lines, surfaces, and volumes or solids. Lines have only the dimension of length, and are either straight or curved. Surfaces embrace both length and breadth, are either plane or curved, and are distinguished as triangles, quadrilaterals, polygons, &c., according to the number of lines within which they are contained. Solids combine the three dimensions of length, breadth, and thickness, and are distinguished as the cube, pyramid, cone, sphere, &c., according as they are bounded by planes, by plane and curved surfaces, or only by curved surfaces. The angle is not an elementary magnitude, but depends on the relative position of lines. Definitions, or statements of *a priori* facts, axioms, or statements of self-evident relations, and propositions, demonstrated from definitions and axioms, as premises, in a series of logical arguments, are the three classes of geometrical truths. Algebra, analytical geometry, and the differential and integral calculus embrace the entire portion of mathematical science in which quantities are represented, not by numbers or diagrams, but by letters of the alphabet. In arithmetic, all propositions concerning numbers embracing units of the same kind, are true without regard to the nature of the quantities to which the numbers may be applied. In geometry, every figure represents all the properties inherent in all the figures of its class. But the truths both of arithmetic and geometry are applicable only to special and actual classes of things. Algebra has a broader generalization. Its symbols extend to all objects whatsoever, and do not suggest ideas of particular things. They stand as representatives of things in general, whether abstract or concrete, real or hypothetical, known or unknown, finite or infinite, possible or impossible. Having the relation of quantities embodied in an equation of symbols, we may proceed to trace what other truths are involved in the one thus stated, resolving the symbolical assertion step by step into others more fitted for our purpose, thus following long trains of symbolical reasoning, every re-

sult of which must express some general truth, though it may not represent any definite and practicable operation upon quantity. Analytical geometry, the application of algebra to geometry, is that branch of mathematical science which examines, discusses, and develops the properties of geometrical magnitudes by noticing the changes which take place in their representative algebraic symbols. The geometrical question is solved by resolving the corresponding algebraic equation. Algebra being defined as the ordinary analysis, calculus is the transcendental analysis, and has various applications in the higher departments of the science. The best achievements of modern mathematics are due to it.—Algebra and geometry are usually, but not with strict accuracy, regarded as types respectively of analytical and synthetical reasoning. The former has an artificial language. Symbols are operated upon according to certain general rules, while the mind dismisses altogether the conceptions of the things which the symbols represent, whether lines, angles, velocities, forces, or whatever else. The steps in the processes are merely applications of the rule. The elements are symbols, and the results are only equations. Geometrical reasoning, on the contrary, is concerning things as they are. It retains the conceptions of quantities. It apprehends the nature of the new truths which it introduces at every step. Analysis is therefore the more powerful instrument for the professed mathematician, but geometry is the more effective mode of exercising the reason, and is a more useful part of the gymnastics of education.—Comte, who makes mathematics preëminent in the hierarchy of the positive sciences, introduces a peculiar classification. Abstract mathematics, according to him, embrace ordinary analysis, or the calculus of direct functions, and transcendental analysis, or the calculus of indirect functions. The former includes arithmetic and algebra; the latter, the differential and integral calculus and the calculus of variations. Concrete mathematics embrace synthetic and analytic geometry, the former being either graphical or algebraic, and the latter being distinguished according as its objects are of two or of three dimensions. Comte includes also rational mechanics, or the laws of statics and dynamics, as a department of concrete mathematics. If the universe were immovable, there would be only geometrical phenomena; but motions are mechanical phenomena.—As commonly explained, the mixed mathematics are the applications of abstract mathematical laws to the objects of nature and art. From the universality and variety of these objects no strict and comprehensive classification of them has been made. Matter in rest and matter in motion are the primary phenomena in space and time. The laws which rule the one and the forces which impel the other are the first objects of inquiry. Mechanics treats of both, and is divided into statics and dynamics, dealing respectively with the equilibrium and the action of forces. Astronomy,

hydraulics, pneumatics, optics, and acoustics may be regarded as subdivisions of dynamics. Surveying, architecture, fortification, and navigation are among the principal applications of mathematics to the arts.—The pure mathematics are merely formal sciences. They occupy and discipline but do not fill the mind. Unlike the elements of metaphysics, their quantities are without quality. The attempt has often been made to ground philosophical speculations upon them, in order to give to the latter mathematical certainty. Thus Pythagoras sought in the ideas of order and harmony mysteriously attached to numbers the reasons for great cosmical phenomena. Plato, who forbade any one unacquainted with geometry to enter his school, combined mathematical with philosophical doctrines especially in his "Timæus," the most obscure of his dialogues. The Neo-Platonists revived the Pythagorean mystical views of numbers. In modern times Wolf and Herbart have been chiefly distinguished for introducing the mathematical method into metaphysical systems. The latter wrote a work on psychology abounding in algebraic formulas. The essential distinction, however, between the elements of the spiritual and the material world, between the fundamental ideas of the two sciences, has prevented any important results from the effort to combine their processes. The definitions, axioms, and processes of mathematics deal with objects of sense, which are known with perfect exactitude, which are apprehended as precisely the same by all, concerning which as phenomena there can be no such thing as opinion, but only absolute certainty, and the reality of the relations between which can be doubted only by disputing the validity of all human ideas. In none of the most scientific metaphysical and moral systems have the definitive and axiomatic elements been thus precisely and authoritatively determined.—The history of mathematics may be divided into three great periods, each characterized by the introduction of important new methods. In the first, the era of Greek and Roman supremacy, geometry was almost exclusively cultivated. While arithmetic was hardly more than a mechanical calculation by means of the abacus, geometrical methods attained a degree of elegance scarcely to be surpassed, as appears from the rank still maintained by Euclid. The Greeks, however, aimed at the exquisite construction of diagrams, not to explain a theory or deduce rules of computation, but for special purposes of measurement. Hipparchus, the father of trigonometry, probably employed mechanical contrivances for the construction of solid angles. The first solution of a difficult problem was the approximate quadrature of the circle by Archimedes. The property of the right angled triangle, supposed to have been discovered by Pythagoras, was known to the earliest Hindoo and Chinese authors of whom there is any record. After the decline of Rome, the sciences took refuge among the Arabs, who translated and preserved the liter-

ary treasures of Greece. The Arab philosophers were, however, rather learned than inventive, and added little to the heritage. But they introduced the second great period in the progress of mathematics by imparting to Europe the decimal arithmetic and the algebraic calculus, both of which were perhaps of Indian origin. The latter, made known in Italy by Leonardo, a merchant and traveller of Pisa, early in the 15th century, soon received important improvements. Scipio Ferrea (1505) was the first to solve a cubic equation. Cardan and Tartalea disputed the honor with him and with each other, while Ferrari solved the biquadratic equation, and Vieta (1600), Girard, and Harriot entered upon the general theory of equations. The algebraic analysis was thus brought nearly to its present state of perfection. It was at first regarded merely as a preparatory process in the investigation of a problem, to be afterward exchanged for a geometrical construction and synthetic proof. But it gradually supplanted diagrams as a medium of demonstration, being found to surpass them in force and compass. With Descartes begins the last and greatest revolution of mathematical science. He disputes with Vieta and Oughtred the honor of having first applied algebra to geometry, bringing all the problems of the latter under the dominion of symbolical analysis. His mode of characterizing curves by an equation between two variable magnitudes revolutionized the mode of conceiving geometrical questions. Symbolical language, found adequate for every purpose, soon became the general medium of mathematical inquiry, and has been the principal weapon by which its subsequent splendid triumphs have been achieved. Perceiving the importance of the discovery, Descartes hastened to apply it to questions of the greatest difficulty and generality, and resolved the problems of tangents and of maxima and minima. The methods of Roberval and Fermat tended toward the discovery of the differential calculus, which was made independently by Newton (under the form of fluxions) and by Leibnitz. Already Napier had invented logarithms, and Newton the binomial theorem; Mercator had accomplished the quadrature of the hyperbola, and Wallis the quadrature of many other curves while seeking that of the circle. The integral calculus (the Newtonian method of quadratures), the inverse of the differential, was improved by Leibnitz and the Bernouillis; Euler completed the theory of analytical trigonometry; Fontaine illustrated that of differential equations; Taylor invented the calculus of finite differences or increments; Cavalieri published his method of indivisibles; and other improvements were introduced by Kepler, Huyghens, and Wallis. The *Principia* of Newton (1687) has gained for him the title of "the profoundest of geometers as well as the first of natural philosophers;" and his influence combined with that of Leibnitz in preparing for the subsequent achievements of the mixed mathe-

matics. Euler, D'Alembert, and the last of the Bernouillis were the most distinguished of their successors till near the close of the 18th century. Euler suggested conceptions in the application of analysis which others elaborated in almost every part of mathematical science; D'Alembert established a principle by which every dynamical question was resolved into a statical one; Daniel Bernoulli received 10 prizes from the French academy of sciences; and other contemporaries, as Clairaut and Maclaurin, were completing the application of mathematics to mechanics and physics. In the period embracing the latter part of the 18th and the early part of the 19th century, the names of Lagrange and Laplace had no rivals. By them the application of all modes of calculation to the mechanics of the universe was carried to the highest pitch of generality and symmetry. One of the most remarkable achievements of the science was Leverrier's prediction in 1846 of the place and orbit of the planet Neptune from the motions of Uranus, announcing before its discovery by the telescope the existence, position, and magnitude of a body beyond the recognized limits of our system, merely as an inference from the perturbations of the outermost planet known to us. Poisson, Airy, Plana, Hansen, Gauss, Adams, De Morgan, and Peirce are among the recent mathematicians who have solved important problems in the physical application of analysis.—Among the greatest works in mathematical literature are the *Principia* of Newton, the *Mechanica* of Euler, the *Théorie des fonctions* and the *Mécanique analytique* of Lagrange, the *Application de l'algèbre à la géométrie* of Monge, and the *Mécanique céleste* of Laplace.—See Montucla, *Histoire des mathématiques*, continued by Lalande (4 vols., Paris, 1799–1802); Bossut, *Essai sur l'histoire des mathématiques* (2 vols., Paris, 1802); Comte, *Philosophie positive*, vol. i.; Libri-Carrucci, *Histoire des sciences mathématiques en Italie* (4 vols., Paris, 1838–'41); Fries, *Die mathematische Naturphilosophie* (Heidelberg, 1822); Poppe, *Geschichte der Mathematik* (Tübingen, 1828); Rösling, *Der Mathematik Grundbegriffe, wahres Wesen und Organismus* (Ulm, 1823); Davies, "Logic and Utility of Mathematics" (New York, 1851); and Davies and Peck, "Mathematical Dictionary" (New York, 1856.)

MATHER. I. RICHARD, an English non-conformist divine, who emigrated to America, born in Lowton, Lancashire, in 1596, died in Dorchester, Mass., April 22, 1669. He received a good education, became a schoolmaster at Toxteth Park, near Liverpool, at the age of 15, determined to study for the ministry, was admitted to Brazenose college, Oxford, in 1618, was ordained a few months later, and became the minister of Toxteth, in which position he remained 15 years. He was suspended for non-conformity to the ceremonies of the established church in 1633, and though soon restored by the influence of friends was again silenced in the following year. He therefore decided to emigrate to New

England, avoided the pursuivants who sought to apprehend him, and landed in Boston Aug. 17, 1685. In the following year he was invited to become pastor of the church in Dorchester, where he resided till his death, and exerted great influence by his weight of character and knowledge of ecclesiastical affairs. He was the author of several brief theological treatises and letters, chiefly on church government, and drew up in 1648, at the instance of the Cambridge synod, a model of discipline, which was accepted in preference to others proposed by Mr. Cotton and Mr. Partridge. He married in 1656 the widow of John Cotton. Of his 6 sons by his first wife, 4 were distinguished clergymen and authors: Samuel (1626-'71), in Dublin, Ireland; Nathaniel (1680-'97), in London; Eleazar (1687-'69), in Northampton, Mass.; and Increase. His "Journal, Life, and Death" has been published for the Dorchester antiquarian and historical society (Boston, 1850). The following epitaph was written upon him:

Under this stone lies Richard Mather,
Who had a son greater than his father,
And eke a grandson greater than either.

II. INCREASE, an American divine, son of the preceding, born in Dorchester, Mass., Jan. 21, 1639, died Aug. 23, 1728. He was graduated at Harvard college in 1656, and in 1658 at Trinity college, Dublin. He afterward preached in Devonshire and the island of Guernsey, and on the restoration was urged to conform and settle in England; but he refused, and on his return to Boston was invited to preach to the North street church, of which he was ordained pastor in 1664. This office he held for 62 years. He was a member of the synod of 1679, and drew up the propositions which were adopted concerning the proper subjects of baptism. In 1681 he was elected president of Harvard college, but the reluctance of his church to relinquish him induced him to decline the position. In 1684 the office was again offered him, and he accepted it with a stipulation that he should retain his relation to his people. He continued in this station till 1701, when he retired in consequence of an act of the general court requiring the president to reside in Cambridge. He procured an act authorizing the college to create bachelors and doctors of divinity, and received the first diploma for the degree of D.D. that was granted in America. He was engaged also in important political services. When in 1683 Charles II. demanded that the charter of Massachusetts should be resigned into his hands, he was foremost in opposing the measure; and when that monarch annulled the charter in 1685, he was sent to England as agent for the colonies. He was in England during the revolution of 1688, and, having found it impossible to obtain a restoration of the old charter, accepted a new one, under which the appointment to all the offices reserved to the crown was confided to him. He returned in 1692, when the general court appointed a day of thanksgiving for his safety and for the settlement of the dispute. He is stated

to have condemned the violent proceedings which followed relating to witchcraft. He was accustomed to spend 16 hours every day in his study, and always committed his sermons to memory. One tenth part of all his income was devoted to purposes of charity. He was the author of 92 distinct publications, now mostly very scarce. His "Remarkable Providences" was republished in the "Library of Old Authors" (London, 1856), with an introduction by George Offor. He married a daughter of John Cotton. **III. CORRON**, an American divine, son of the preceding, born in Boston, Feb. 12, 1668, died Feb. 13, 1728. He manifested an early passion for books and learning, studied at the free school in Boston, and entered Harvard college at the age of 12; and at his graduation in 1678 Pres. Oakes expressed his expectation that he would resemble his venerable grandfathers John Cotton and Richard Mather, who should be united and flourish again in him. He was early distinguished for piety, was accustomed to frequent prayer as a school boy, reproved his associates for profanity or misconduct, in his 14th year began a system of rigid and regular fasting and vigils which he continued through life, and at the age of 16 made the Christian profession. He was occupied after leaving college with teaching, and was for a time diverted from his purpose of becoming a preacher by an impediment in his speech; but having discovered how to avoid stammering by a "dilated deliberation" in his enunciation, he devoted himself particularly to theological studies, in 1680 became the assistant of his father in the pastorate of the North church, Boston, and in 1684 was ordained as his colleague. He discharged his pastoral duties with singular zeal, pursuing his studies, elaborately preparing his sermons, publishing numerous works of devotion, secretly praying for special and suitable blessings on each member of his church, ejaculating prayers for those whom he met when he walked the streets, and availing himself of every occasion to inculcate lessons of piety. It was his aim also to maintain the ascendancy which had previously belonged to the clergy in New England in civil affairs, but which was then on the decline. "New England," he wrote, "being a country whose interests are remarkably inwrapped in ecclesiastical circumstances, ministers ought to concern themselves in politics." When, at the report of the landing of the prince of Orange in England, Gov. Andros was seized and imprisoned in Boston, Cotton Mather prepared the public declaration justifying the measure. But it is in connection with proceedings concerning witchcraft that he is most generally known. It appears that his influence rather encouraged than restrained the delusion; but the belief in this kind of supernatural agency was common at that time, doubts existing only as to particular cases. In 1685 he published his "Memorable Providences relating to Witchcraft and Possessions," narrating cases which had occurred at intervals in different parts of the country, which was used as an authority in

the prosecution of the "Salem tragedy." When the children of John Goodwin became curiously affected, in 1688, he was one of the 4 ministers of Boston who held a day of fasting and prayer, and favored the suspicion of diabolical visitation. He afterward took the eldest daughter to his house in order to inspect the spiritual and physiological phenomena of witchcraft, and his experiments are wonderful instances of curiosity and credulity. He discovered that the devils were familiar with the Latin, Greek, and Hebrew, but seemed less skilled in the Indian languages, suspected that they were not all alike sagacious, and was persuaded that he himself was shielded against their power by special protection of Heaven. A discourse, in which he pronounced witchcraft "the most nefarious high treason against the Majesty on high," was printed with a copious narrative of his recent researches, and the particulars were reprinted in London with a preface by Richard Baxter. When the first phenomena occurred at Salem in 1692, he at once became a prominent adviser concerning them, expressing his eagerness "to lift up a standard against the infernal enemy," whose assaults upon the country he regarded as "a particular defiance upon my poor endeavours to bring the souls of men unto heaven;" and in order to convince all who doubted the obsessions and disapproved of the executions, he wrote his "Wonders of the Invisible World" (1692), a work which received the approbation of the president of Harvard college and of the governor of the state, though it was designed to encourage the excesses and to promote "a pious thankfulness to God for justice being so far executed among us." When the reaction in the popular mind followed, he vainly attempted to arrest it; and though he afterward admitted that "there had been a going too far in that affair," he never expressed regret for the innocent blood that had been shed, and, instead of taking the responsibility on himself and his coadjutors, charged it upon the powers of darkness, whose skill and malignity "had circumvented them, and made them proceed against persons who were not guilty." Finally, he sought to shun the odium of the popular feeling by declaring the subject "too dark and deep for ordinary comprehension," and referring it for decision to the day of judgment. By the publication of Robert Calef's "More Wonders of the Invisible World" (London, 1700), in which the veracity of many of the narratives of Mather was disputed, the delusion was at length dissipated. Though his influence consequently declined, his activity continued. The most learned of the alumni, he expected to have been called to the presidency of Harvard college in 1707, and was again disappointed in 1724 that this office was conferred on another. His publications amounted to 882, many of them small books and sermons. His *Magnalia Christi Americana* (London, 1702; 2 vols., Hartford, 1820) is a chaotic collection of materials for an ecclesiastical history of New England, concern-

ing which he was admitted to know more particulars than any other man. Though strongly marked by his partialities and prejudices, its somewhat quaint and grotesque character, its admixture of superstition, learning, and ingenuity, make it still interesting. In 1718 his *Curiosa Americana* was read before the royal society of London, and he was elected a member of that body, being the first American to receive this distinction. In its "Transactions" in 1721 appeared an account of the practice of inoculation for the small pox, recently introduced by Lady Mary Wortley Montagu; and it was by the efforts of Mather in connection with Dr. Boylston, against both professional and popular prejudice, that the operation was first performed in Boston. His "Essays to Do Good" (1710) was admitted by Dr. Franklin to have influenced some of the principal events of his life; and his "Christian Philosopher" and "Directions for a Candidate of the Ministry" enjoyed high repute. His greatest undertaking was entitled "Illustrations of the Sacred Scriptures." He labored industriously upon it from his 81st year to his death, and it now forms a prodigious manuscript volume in the library of the Massachusetts historical society. His life was written by his son, Samuel Mather (1729), and again by W. B. O. Peabody in Sparks's "American Biography." IV. MOSES, D.D., an American clergyman, a descendant of Richard Mather, born in Lyme, Conn., Feb. 28, 1719, died in Darien, Conn., Sept. 21, 1806. He was educated at Yale college, of which he was a fellow for 18 years. In 1744 he was installed over the Congregational church in Darien, Conn., of which he remained the pastor until his death. He warmly espoused the cause of the colonies in the war of the revolution, and was twice taken captive by the British and Tories, and carried to New York, where he was confined in the Provost prison. He published a pamphlet in reply to Dr. Bellamy on the half-way covenant, and a sermon on predestination; and was the author of a posthumous work entitled "A Systematic View of Divinity, or the Ruin and Recovery of Man" (12mo., 1818).

MATHEW, THEOBALD, D.D., "the apostle of temperance," born in Thomastown, co. Tipperary, Ireland, Oct. 10, 1790, died Dec. 8, 1856. His father was an illegitimate member of the family of the earls of Llandaff, and died while his children were still young. Theobald was adopted by his aunt, who sent him to an academy at Kilkenny, whence he passed at the age of 20 to the college of Maynooth. While here he resolved to embrace a monastic life, and accordingly he entered a Capuchin convent at Kilkenny, where he remained until after his ordination in 1814, when he was placed in charge of a chapel in Cork. About this time he received from Rome the degree of D.D., and a dispensation permitting him to hold property. His urbane manners and charitable disposition soon acquired for him an extraordinary influence. He interested himself warmly in the

condition of the lower classes, and organized, on the plan of the society of St. Vincent de Paul, a religious association for visiting the poor and sick, in which he induced numbers of young men to enroll themselves. In 1838 his attention was called to the temperance movement by an invitation from a number of teetotalers in Cork to join them in devising means for the prevention of drunkenness; and a total abstinence society was formed, of which he was unanimously chosen president. Thirty-five persons took the pledge at his hands at once; on the following day several hundreds joined the society, and in the course of 5 months he numbered 150,000 converts in the city of Cork alone. No small part of this success was due to Father Mathew's personal popularity. The rapid improvement which was remarked in those who took the pledge served to increase the general enthusiasm, and many of the more ignorant even ascribed to their leader the power of working miracles. He was invited to all parts of Ireland. In Limerick the crowds who came to hear him from the furthest parts of Connaught were so large, that but for the liberality of the citizens there would have been a famine in the place. He now gave up every thing else to devote his life to the cause of temperance. At Galway he administered the pledge to 100,000 persons in two days, and after visiting every large town in Ireland he went to London, Liverpool, Manchester, and other places in England, where he was received with the greatest enthusiasm. His benevolent labors had involved him deeply in debt, and although he received from the queen a pension of £300, the whole or most of it was applied to paying an insurance on his life for the benefit of his creditors. His brother, a wealthy distiller in Ireland, assisted him until his business was ruined by the progress of the temperance movement. Another of Father Mathew's brothers and his brother-in-law were also engaged in the liquor manufacture. After travelling and lecturing for some time in England with scarcely less success than in his native country, he visited the United States, lecturing in the principal cities, and returned to Ireland in the autumn of 1851.

MATHEWS, CHARLES, an English actor, born in London, June 28, 1776, died in Plymouth, June 28, 1835. He was educated at the merchant tailors' school, and subsequently was apprenticed to his father, a bookseller in the Strand. Gifted with strong powers of mimicry, he gradually imbibed a predilection for the stage, and, after appearing at several provincial theatres as an amateur, was engaged as a comedian at the theatre royal, Dublin. Meeting with unjust treatment here both from the manager and the public, he determined to return to his father's business; but on the way to London he was tempted to accept an engagement at Swansea, where he performed for some time with success. After filling an engagement of several years at York, he became a member of the Haymarket company, and on May 16, 1803,

made his début before a London audience as Jubal in "The Jew." He continued for many years to perform at the principal London theatres; but feeling that the parts assigned to him did not afford fair scope for the exercise of his talents, he instituted in 1818, in imitation of Foote and Dibdin, a species of entertainment in the form of a monologue, which, under the title of "Mathews at Home," proved very successful. For 5 successive seasons he drew crowded audiences to the English opera house, where, by his comic songs, recitations, anecdotes of personal adventure, and imitations of well known actors, he greatly enhanced his reputation. In 1822-'3 he made a successful tour in the United States, where he gathered materials for his "Trip to America," which was received with not less favor than his "At Home." He continued both entertainments for upward of 10 years longer, appearing at intervals on the stage in the regular drama; and in 1834, at the urgent request of American managers, he returned to America and performed his "Trip" to delighted audiences. He died soon after his return to England. His powers of mimicry, in which he has scarcely been approached by modern actors, combined with an expressive countenance, a flexible voice, and keen discernment, gave him a high position on the English stage. He had the faculty of identifying himself with the part he personated, and his Mawworm, Sir Fretful Plagiary, Morbleu, Monsieur Mallet, Multiple in the "Actor of All Work," &c., were among the most finished and original conceptions of the comic drama. His imitative powers were abundantly displayed in his "At Home," which was written for him by various authors in succession. In private life he was greatly esteemed, and possessed the friendship of Coleridge, Lamb, and other eminent men.—CHARLES, son of the preceding, born in the early part of the present century, was educated as an architect, but subsequently went upon the stage, and has for a number of years held a prominent place as a light comedian. In connection with his wife, better known as Madame Vestris, he was for years manager of the Olympic and Lyceum theatres in London. In 1857-'8 he made a professional tour in the United States, where he was married a second time.

MATHEWS, CORNELIUS, an American author and journalist, born in Port Chester, N. Y., Oct. 28, 1817. He was graduated at the university of New York, and commenced his literary career in 1836 by a series of contributions in prose and verse to the "American Monthly Magazine." During the next two years he contributed to the "New York Review," the "Knickerbocker Magazine," and other periodicals, and in 1839 published "Behemoth, a Legend of the Mound Builders." In 1840 he produced "The Politicians," a comedy, and in 1841 "The Career of Puffer Hopkins," a novel illustrating various phases of political life in New York. His remaining works comprise "Poems on Man in the Republic" (1848); "Big Abel and Little Man-

battan" (1845); "Witchcraft," a tragedy, first performed in Philadelphia in 1846, and which Margaret Fuller called "a work of strong and majestic lineaments;" "Jacob Leisler," a play produced in Philadelphia in 1848; "Money-penny, or the Heart of the World" (1850); "Chanticleer, a Thanksgiving Story of the Peabody Family" (1850); "A Pen and Ink Panorama of New York City" (1853); "False Pretences," a comedy (1856), &c. He was also for some time associate editor of "Arcturus," a monthly magazine, has edited various journals and contributed largely to the "Literary World" and other periodicals, and has been an active advocate of international copyright.

MATHEWS, GEORGE, an American jurist, born near Staunton, Va., Sept. 21, 1774, died at Bayou Sara, La., Nov. 14, 1836. He was the son of Gen. George Mathews, an officer of the revolutionary army, and subsequently governor of Georgia, and after a brief course of study at Liberty Hall academy, Rockingham co., Va., was in 1799 admitted to the bar of Georgia. In 1805 he was appointed by President Jefferson judge of the superior court of Mississippi territory, and in the succeeding year one of the judges of the superior court in the territory of Orleans. Although he had little knowledge of the civil law, and no experience in the system then prevailing in the territory, and which was rendered more complicated by engrafting upon the combined French and Spanish codes in vogue certain fundamental principles of the common law, his decisions did much to form a permanent system of jurisprudence. On the organization of the state judiciary of Louisiana Judge Mathews was appointed presiding justice of the supreme court, a position which he filled during the remainder of his life.

MATHIAS, THOMAS JAMES, an English author, born about 1750, died in Naples in 1835. He was graduated at Trinity college, Cambridge, in 1774, and several years later received an appointment in the royal household, which he held until 1818, when he retired on a pension. He commenced his literary career by publishing a volume of "Runic Odes" imitated from the Norse (4to., 1781), and in 1783 produced an "Essay on the Evidence relating to the Poems attributed to Thomas Rowley." In 1794 he published the first part of an anonymous poem, of which 3 other parts subsequently appeared, entitled the "Pursuits of Literature," remarkable for stinging criticisms on literary men and opinions. It was followed by a variety of minor pieces of a satirical character, after which he published in 1814 an edition of the works of Thomas Gray, with his life and additions (2 vols. 4to., Cambridge). The latter part of his life was passed at Naples, where he wrote and published much on Italian literature.

MATSYS, METSYS, or MEAYS, QUINTIN, a Flemish painter, born in Louvain about 1460, or according to some authorities in Antwerp in 1450, died in Antwerp in 1529. He was of humble extraction, and brought up as a black-

smith, in which trade he continued until about his 20th year, when, according to the popular story, he became enamored of a painter's daughter, and in order to win her hand forsook the anvil for the easel. He probably studied with his wife's father, but his peculiar style and excellence in his art were due to his own genius and industry. He painted in the dry, hard style of the early Flemish masters, colored highly, and was distinguished for minuteness of finish and force of expression, particularly in pathetic religious subjects; although elsewhere he exhibits a peculiarly cheerful and fresh conception of life, and occasionally considerable humor. His chief work is the great altarpiece in the museum at Antwerp, consisting of a centre and two wings; in the former is represented the "Descent from the Cross," of which Sir Joshua Reynolds says: "There are heads in this picture not exceeded by Raphael;" the latter are devoted to incidents in the history of St. John the Baptist and St. John the Evangelist. The artist received but 800 florins for this work; but Philip II. subsequently endeavored in vain to purchase it, and Elizabeth of England is said to have offered the enormous sum of 64,000 florins for it. One of his best authenticated works is that in Windsor castle known as "The Misers," of which several repetitions are in existence. The heads are painted in a masterly manner, and are full of character. About 70 pictures are ascribed to him, and these are widely distributed throughout the chief galleries of Europe, and are highly prized.

MATTER, JACQUES, a French philosopher and historian, born in Alt-Eckendorf, department of Lower Rhine, May 31, 1791. Though of German parentage, he was early habituated to the use of the French language. He was intended for the legal profession, and enjoyed the best educational privileges under private instructors, at the gymnasium of Strasbourg, and under Heeren and Eichhorn at Göttingen. He went to Paris with a diplomatic career in view, attended the lectures of the faculty of letters, and wrote his *Essai historique sur l'école d'Alexandrie*, which, crowned by the academy in 1816, gave him reputation among those French scholars who were interested in German erudition, and was published in 1820. By favor of Royer-Collard and Guizot he received in 1819 a professorship in the college of Strasbourg, which he exchanged two years afterward for the direction of the gymnasium and the professorship of ecclesiastical history in the Protestant academy of the same city. Applying himself to the study of ecclesiastical history and philosophy, he wrote his *Histoire critique du gnosticisme* (2 vols., Paris, 1828), and *Histoire universelle de l'église Chrétienne* (8 vols., 1829-32). In 1828 he was appointed inspector of the academy of Strasbourg, and in 1831 corresponding member of the academy of inscriptions. His treatise *De l'influence des mœurs sur les lois et des lois sur les mœurs* (Paris, 1832) received from the academy an extraordinary prize of

10,000 francs. In 1833 he was appointed by Guizot general inspector of the university of Paris, and removed to that city. Among his later productions are: *Histoire des doctrines morales et politiques des trois derniers siècles* (8 vols., 1836-'7); *De l'affaiblissement des idées et des études morales* (1841); *Schelling et la philosophie de la nature* (1842); *De l'état moral, politique et littéraire de l'Allemagne* (2 vols., 1847); *Histoire de la philosophie dans ses rapports avec la religion* (1854); and *Philosophie de la religion* (2 vols., 1857). He has also written occasional treatises concerning schools and education, and numerous articles in the *Dictionnaire de la conseration* and other cyclopædias. As a philosopher, he inclines rather to the Scotch than the German systems.

MATTHEW, SAINT, one of the 12 apostles, and author of the first Gospel. The New Testament tells us little of his personal history. He was a son of Alphaeus, and a receiver of customs at the lake of Tiberias. Jesus, while passing one day, said to him: "Follow me;" and Matthew at once obeyed. Most exegetical writers assume that the publican Levi, whose call to the discipleship is recorded by Mark and Luke, is the same person as Matthew; yet among the opponents of this view are Origen, Grotius, Michaelis, and Ewald. After the ascension of Christ, we find Matthew at Jerusalem, with the other apostles, continuing "with one accord in prayer and supplication, with the women, and Mary the mother of Jesus, and with his brethren." Then history loses sight of him. He is said to have preached the gospel during 15 years in Jerusalem, and then to have turned to other nations. Among these are mentioned the Ethiopians, Macedonians, Syrians, Persians, Parthians, and Medes. (See Wiltch, "Geography and Statistics of the Church," London, 1859.) He is said to have been burned alive in Arabia Felix; and according to Baronius, his body was brought to Palermo in 954. The Roman Catholic church keeps his festival on Sept. 21, the Greek on Nov. 16. —The Gospel of Matthew was, according to the unanimous tradition of the ancient church, composed in Hebrew, or rather Aramaic, the language spoken at that time in Palestine. Following Erasmus, a number of eminent Protestant theologians, as Calvin, Beza, Lightfoot, Credner, De Wette, Ewald, &c., and among Roman Catholics Hug, have contested the correctness of this tradition, and advocated the originality of the Greek text; but the opposite theory has found able defenders, among whom are Rich, Simon, Marsh, Olshausen, Baur, and Delitzsch, and has clearly regained of late the ascendancy in the theological world. Opinions again are divided as regards the relation of the Greek text contained in the canon to a lost Hebrew original. Some, as Bengel, Olshausen, and Guericke, regard it as probable that the Greek translation was made either by Matthew himself or with his consent and co-operation; but this is more commonly denied. A considerable number of distinguished theo-

logians, as Lachmann, Credner, Ewald, Reuss, and Meyer, infer from a passage of the early ecclesiastical writer Papias, that Matthew himself compiled only a summary of the sermons and sayings of Christ, which was put into historical form by another writer. But weighty authorities have since shown that this passage of Papias admits of another interpretation. The Gospel, whether composed in Hebrew or in Greek, was undoubtedly written for Christians of Jewish descent in Palestine. The time of its composition is entirely uncertain. The statements of the ecclesiastical tradition vary from A. D. 41 to 67; a majority of modern writers seem to agree in fixing it between 60 and 67. The chief aim of this Gospel is evidently to prove the Messianic character of Jesus. For its relation to the Gospels of Mark and Luke, see MARK; and for collective commentaries on all the four, or the first three Gospels, see LUKE. The commentary of Olshausen is especially valuable. The commentary by De Wette was in the former editions pervaded by the views of Strauss, but the 4th and last edition (1856) has been revised by a theologian of the orthodox school. More information on the origin and genuineness of the Gospel of Matthew may be found in Siefert, *Ueber die Echtheit und den Ursprung des ersten Evangelii* (1832); Schneckenburger, *Ueber den Ursprung des ersten Evangelii* (1834); Schott, *Ueber die Authentizität des Ev. Matth.* (1837); Kern, *Ueber den Ursprung des Ev. Matth.* (1837).

MATTHEW OF WESTMINSTER, an English historian of the end of the 13th or beginning of the 14th century. He was a Benedictine monk of the abbey of Westminster, where he spent his life, and composed his *Flores Historiarum* in 8 books, the 1st of which extends from the creation to the birth of Christ, the 2d to the Norman conquest, and the 3d to the death of Edward I. The *Flores Historiarum* was published in London in 1567, and at Frankfort in 1601. A translation of it by C. D. Yonge forms 2 volumes of Bohn's "Antiquarian Library" (1853).

MATTHEWS, a S. E. co. of Va., bordering on Chesapeake bay; area, 68 sq. m.; pop. in 1850, 6,714, of whom 2,923 were slaves. It is a peninsula, having the Piankatank river on the N., the Chesapeake on the E., and Mobjack bay on the S. W., and connected with the mainland by an isthmus 1 mile wide; length 20 m., greatest width 8 m. It has a level surface and moderately fertile soil. The productions in 1850 were 7,640 bushels of wheat, 4,940 of Indian corn, and 4,059 lbs. of wool. Value of real estate in 1856, \$749,363; increase since 1850, 18 per cent. There were 9 churches, and 400 pupils attending public schools. Ship building is prosecuted. Capital, Westville.

MATTHEWS, GEORGE, an American soldier and statesman, born in Augusta co., Va., in 1739, died in Augusta, Ga., Aug. 30, 1812. At the age of 22 he commanded a volunteer company against the Indians, and acted a very important part in the battle of Point Pleasant,

at the junction of the Ohio and Kanawha rivers, Oct. 10, 1774. He held a colonel's commission in the revolution, and was present at the battles of Germantown and Brandywine. At the former he was taken prisoner, and confined on board a prison ship in New York harbor. He was not exchanged until after the termination of the war, when he joined the army under Gen. Greene, as commander of the 8d Virginia line. Subsequently he purchased a tract of land on Broad river, in Oglethorpe co., Ga., to which he removed with his family. In 1780 he was elected governor of Georgia, and reelected in 1794-'5.

MATTHIAS, a religious impostor, whose real name was Robert Matthews, born in Washington co., N. Y., about 1790, died in Arkansas. He kept a country store, married in 1818, and maintained an excellent reputation until 1816, when he failed and went to reside in New York. In 1827 he removed to Albany, where he became much excited by the preaching of the Rev. Messrs. Kirk and Finney. He afterward engaged actively in the temperance cause, and, claiming to have received a revelation, took to street preaching. Failing to accomplish his avowed object of converting Albany, he prophesied its destruction and fled secretly to the city of New York, where he involved a number of respectable families among the victims of his delusions; was tried and acquitted on a charge of poisoning a wealthy disciple in whose family he was domesticated; and his impositions having been exposed, he lost his influence, and soon disappeared from public view.—See "Matthias and his Imposture," by W. L. Stone (New York, 1835).

MATTHIAS, JOHN. See ANABAPTIST.

MATTHIAS CORVINUS. See HUNGARY, vol. ix. p. 858.

MATTHISSON, FRIEDRICH VON, a German lyric poet, born near Magdeburg in Jan. 1761, died near Dessau, March 13, 1831. Having developed considerable talents as a poet, and gained great popularity with the public, he was patronized by various German princes, but retired from court life in 1824. His "Elegy in the Ruins of an Old Castle" is one of his finest lyrics. He edited selections from the lyric poets of Germany under the title of *Lyrische Anthologie* (20 vols., Zürich, 1808-'7). His posthumous works were published in Berlin in 1832.

MATTO GROSSO, the westernmost province of Brazil, between lat. 7° and 24° S., and long. 50° and 65° W., bounded N. by Alto Amazonas and Para, E. by Goyaz, S. by Parana, and W. by Bolivia; area, 406,500 sq. m.; pop. in 1856 estimated at 85,000, mostly Indians. This immense region is covered to a great extent with dense forests, and traversed by a mountain chain which forms the principal watershed between the basins of the Amazon and the Rio de la Plata. From this chain numerous ramifications proceed, whose intervening valleys gradually expand into vast plains of exuberant fertility. The principal rivers are the Madeira,

Juruena, and Chingua, which flow N. to the Amazon, and the Parana, Paraguay, and Cuyaba, whose course is S. There are several lakes, and some of considerable size. The chief vegetable productions are rice, millet, cotton, sugar, tobacco, gums, balsams, and medicinal plants. Among the animals are the puma, jaguar, wolf, deer, and hare, and almost every variety of the feathered tribe. Minerals abound in many districts. This province is among the finest diamond districts of Brazil. The diamonds of Matto Grosso are very small, but exceed in brilliancy all other Brazilian diamonds.

MATURIN, CHARLES ROBERT, a British dramatist and novelist, born in Dublin in 1782, died there, Oct. 30, 1824. He was educated at Trinity college, Dublin, received holy orders, and became curate of St. Peter's in his native city. To increase his limited income, he devoted his leisure to literary composition; and in 1807 he published the "Fatal Revenge, or the Family of Montorio," a novel written in the style of Monk Lewis and Mrs. Radcliffe. It was followed by several other romantic fictions, as the "Milesian Chief," the "Wild Irish Boy," "Women, or Pour et Contre," and "Melmoth the Wanderer," the wildest of them all, the hero of which is a sort of absurd Dr. Faustus, in league with Satan, and performing all manner of marvels. His last romance, the "Albigenses," appeared just before his death. In 1816 his tragedy of "Bertram" was accepted by the management of Drury Lane theatre, through the influence of Lord Byron, and was produced with Kean in the principal part. By its performance and its publication the author realized £1,000. His subsequent tragedies, "Manuel" and "Fredolpho," are very inferior. He also published a poem on the "Universe," and a volume of "Controversial Sermons." He was noted for his eloquence in the pulpit.

MAUCH CHUNK, the capital of Carbon co., Penn., situated on the W. bank of the Lehigh river at its passage through the Mahoning mountain, and on both sides of the mouth of Mauch Chunk creek, 112 m. N. by W. from Philadelphia; pop. in 1850, 3,727. The town is built chiefly in the valley of the creek, between the Mahoning and Sharp mountains, in so contracted a place that no room is afforded for gardens to the houses. The hills on each side rise precipitously to the height of several hundred feet, and not far back attain an elevation of more than 1,000 feet above the river. The place derives its importance from the mines of anthracite and of iron ore found in the Sharp mountain at this eastern extremity of the southern anthracite field of Pennsylvania. The mines of Summit hill or Sharp mountain, 9 m. W. from the village, up the valley of Mauch Chunk creek, have been famous as among the oldest known and most productive of the coal mines in the state. One bed more than 50 feet thick has been worked over many acres, and its products are brought down with those of the other mines of the vicinity to Mauch Chunk to

be sent down the Lehigh canal. The cars run by gravity the whole distance to Mauch Chunk, and were formerly drawn back by mules, which made the descent in cars provided for them. But by a bold system of engineering a return track is now laid out, along which the cars descend from the chutes at the canal to the foot of Mt. Pisgah, the high point of Sharp mountain next the river, and are then raised to its summit up an inclined plane by a stationary steam engine. From this point they then run 6 m. by gravity to the foot of another inclined plane, up which they are raised as before, and from its summit descend to the different mines. The Lehigh canal, with the slack water navigation of the Lehigh, is continued 25 m. further up the river to Whitehaven, whence a railroad is extended to Wilkesbarre in the northern anthracite field. The engineering work upon the river and canal is exceedingly bold and massive, some of the dams across the river being 50 feet high, and the lift of the water in the locks 83 feet. The timber collected from the forests on the mountains adds largely to the business of the canal and of Mauch Chunk. The town has 5 churches, 2 large blast furnaces for smelting iron, and 2 weekly newspaper offices.

MAULMAIN, or **MOULMEIN**, a port of Tenasserim, on the E. side of the bay of Bengal, at the mouth of the Salwin, on a small peninsula formed by that river and the Gyne and Attaram, and nearly opposite the Burmese town of Martaban; lat. $16^{\circ} 30' N.$, long. $97^{\circ} 42' E.$; pop. about 20,000. The banks of the river are lined with jungle from its mouth to the town, and the horizon is bounded, at the distance of from 1 to 6 m., by hills which run parallel with the stream and are covered with trees to their summits. The native houses are raised on piles, about 10 or 12 feet from the ground, and are formed of mats and palm leaves. The houses of the Europeans and those of the wealthier class of Burmans are built entirely of wood, also raised upon piles. There are a few scattered brick buildings. The native town consists of one long street, which runs for nearly 4 m. along the bank of the Salwin, and a few others which branch from it toward the heights on the E. and connect it with the European houses. There are several wooden jetties along the shore. The inhabitants of Maulmain consist of Burmans, Talains, Chinese, Bengalese, and Madrasese, with a few Armenians, Jews, and Cingalese. A considerable number of Europeans are settled there, and a few American missionaries, among whom the Rev. Dr. Judson was formerly the most prominent. There are 7 Christian churches, 5 of which are Protestant, 8 English and native schools, and 8 printing presses. Maulmain is a place of considerable trade, principally with Calcutta, Madras, Rangoon, and Penang. The exports consist chiefly of timber, ivory, wax, stick lac, caoutchouc, cajuput oil, gum resins, nut oil, sandal wood, dammar, tanning substances and dyes, aloes, and sapan wood. With the exception of timber, all the articles used in ship building are

imported, beside cotton cloth, coarse earthenware, sugar, tobacco, arms, and gunpowder. The forests in the immediate neighborhood of Maulmain yield an abundant supply of teak timber, and ship building is successfully carried on, many vessels of large size and superior class having been built. The total value of the trade, both export and import, is nearly \$3,000,000 per annum. When the Tenasserim provinces were ceded by the Burmese to the British, in 1826, the site upon which Maulmain stands was covered with jungle overrun by tigers. The heat is not so oppressive as on the coast of Coromandel, the thermometer seldom rising above 90° in the shade.

MAUNA LOA, or **MOUNA ROA** ("long or high mountain"), a volcano of the Sandwich islands, situated a little S. of the central part of the island of Hawaii, 40 m. from the coast. Its height, as ascertained by Lieut. Wilkes of the U. S. exploring expedition, is 13,758 feet. From the sea it presents the appearance of a smooth, regular hill of no great elevation, clad with forests part way up its sides, and rounded off at the top like a dome. It has been built up by the accretions hurled from the bowels of the earth by volcanic agency (to which indeed the whole island owes its origin), but unlike many other volcanoes it has no cone of ashes. Its craters are numerous, occurring on the summit and on the sides, and new ones are frequently opening. The terminal crater, called by the natives Moku-a-weo-weo, is about 15,000 feet in length and 8,000 in width; its W. bank is 784 feet in depth and its E. bank 470 feet. The bottom was reached by Wilkes, who describes it as traversed by ridges from 10 to 50 feet in height, alternating with deep chasms, smooth beds of hardened lava, and fissures from which issue clouds of steam and smoke. A short distance to the N. of it is the smaller crater of Pohakuohanaiei, and when Lieut. Wilkes was here (Dec. 1840) there were two others on the summit. The whole top of the mountain is one expanse of lava, which has been thrown out in a fluid state, and lies like a smooth mass of metal, or in vast beds of clinkers spread over an area of miles, and occasionally raised from 10 to 20 feet above the surrounding surface. There is no rock nor sand to be seen. On the S. E. side of the mountain is a pit crater 88 feet deep by 200 feet in diameter, in which Dr. Judd, who accompanied Lieut. Wilkes, was overtaken by a sudden eruption and narrowly escaped death, though not without a few burns. In 12 minutes from the first outbreak the pit was full of molten lava. On the same side of the mountain, at an elevation of 4,104 feet above the sea, is the great crater of Kilauea, which is $3\frac{1}{2}$ m. long, $2\frac{1}{2}$ m. wide, and 1,044 feet deep. A black ledge of hardened lava, from 600 to 2,000 feet in width, surrounds it at a depth of 660 feet, and the bottom is occupied by a surging lake of liquid fire, over which hangs a cloud, silvery by day and glowing red by night. Vapors and steam escape

from numerous apertures; and even in times when the fires are comparatively at rest, masses of red-hot matter are every now and then cast up to the height of 60 or 70 feet. During Lieut. Wilkes's visit (Jan. 17, 1841) the lake overflowed, and in one night discharged about 15,000,000 cubic feet of lava, while the discharge from the small pit, which he called Judd's lake, was calculated to amount in a day to 200,000,000 cubic feet. Kilauea was long held in awe by the natives as the abode of the goddess Pele, and the slender threads of hardened lava spray which are collected around it are called by them "Pele's hair." During the last 4 or 5 years Manna Loa has been unusually active. A violent eruption occurred in 1855, lasting 18 months, and sending its streams of lava over an area estimated at 800 sq. m. Another began Jan. 28, 1859. Three new craters were opened in the side of the mountain, the highest being about 10,000 feet above the sea. The two lower were the scenes of the most violent action. They are about a mile apart, and were described by an observer as two cones of pumice and lava, each about 150 feet high; from the lower one, which was nearly 1,000 feet in diameter, rose a column of liquid lava from 200 to 500 feet high. From this place the fiery torrent found its way by a subterranean passage to an outlet about half a mile distant, where it bubbled up in a pool a few rods wide, and poured in a cataract, at a white heat, over a precipice of 50 feet. It spread over the whole lower slope of the mountain in a network of streams, and passing around the N. side reached the sea in 5 days, destroying a fishing village in its way. The meeting of the lava and the waves is described as one of the most terrific sights ever witnessed. In November the flow still continued; the lava on reaching the water, full 40 m. from the crater, was still at a light red heat, and moved with a velocity of 2 or 3 m. an hour. The stream in some places was 5 or 6 m. wide. Kilauea in the mean time continued comparatively quiet, but its fiery lake was gradually increasing in size, and in Nov. 1859 had risen to a level with the black ledge described by Wilkes. This rising of the lake has occurred before, as the structure of the ledge indeed shows, but it never runs over, its discharge always being effected by subterranean channels. Several shocks of earthquake accompanied the great eruption of 1859, two in February, one in July, and two in November.

MAUNDAY THURSDAY. See HOLY WEEK.

MAUPERTUIS, PIERRE LOUIS MOREAU DE, a French geometrician and astronomer, born in St. Malo, July 17, 1698, died in Basel, July 27, 1759. He was 5 years in the army, during which time he studied mathematics with great success; but he abandoned the service in 1728, and was admitted into the academy of sciences. The ability which he displayed in opposing the physical theory of Descartes, which was maintained by Fontenelle, and substituting for it that of Newton, gained him admission in 1727 into the

royal society of London. The controversy had excited public interest, when the French government resolved to verify one of the hypotheses of the British philosopher, that of the flattening of the terrestrial globe near the poles. Maupertuis was at the head of a commission of academicians, which in 1736-'7 measured a degree of longitude in Lapland; and the result, confirming the conjecture of Newton, gave him distinction throughout Europe. He was invited by Frederic the Great to Berlin, where he became president of the academy founded by Leibnitz, married a lady of a distinguished family, and received large pensions. In 1750 he became involved in a controversy with König, who disputed one of the principles which Maupertuis claimed to be an immense discovery in physics, and who moreover maintained that the principle was a plagiarism from Leibnitz. The leading savants of the time took part in the discussion, but the learned memoirs of Euler in defence of Maupertuis were an insufficient answer to the wit and satire of Voltaire in his *Diatrise du docteur Akakia, médecin du pape*. The latter years of his life were afflicted by illness, and he died at the house of Bernouilli while on a journey in Switzerland in quest of health.

MAUR, CONGREGATION OF ST., a congregation of reformed Benedictines in France, celebrated for the zeal with which they devoted themselves to literature. Their body was organized in 1618, and confirmed in 1621 and 1627. It comprised at one time about 124 houses, was divided into 7 provinces, and governed by a general who resided in Paris. All the generals of the congregations were distinguished scholars. Literature owes to this congregation a number of laborious works, especially the best collective edition of the Greek and Latin church fathers. Montfaucon, Mabillon, and Ruinart belonged to it. The congregation was broken up by the French revolution, and an effort of the few surviving members to effect its reestablishment in 1815 did not succeed. In 1833, however, the first convent was restored at Solesme in the diocese of Le Mans, the monks of which have conjointly undertaken the publication of the *Spicilegium Solesmense*, a collection of inedited works and fragments of ecclesiastical antiquity, which has been well received in the literary world.—See Herbst, *Die Verdienste der Mauriner um die Wissenschaften* (in the *Theolog. Quartalschrift* of Tübingen, 1833 and 1834).

MAUREPAS, JEAN FRÉDÉRIC PHELYPEAUX, count, a French statesman, born in 1701, died in 1781. He was grandson of the chancellor Pontchartrain, and at the age of 14 years succeeded his father as secretary of state, the administration of the office being intrusted to his relative the marquis de La Vrillière till the death of the latter in 1725, when he became himself the acting minister. He discharged the duties of this office till 1749, embellished the capital, sent La Condamine, Maupertuis, and other savants to measure an arc of the meridian on the equator and another near the north pole, and

promoted the expeditions of Sevin and Fourmont to Greece and the Orient, and of Jussieu to Peru. An epigram which he wrote upon Mme. de Pompadour caused his banishment from court for 25 years; he remained two years at Bourges, and then lived near Versailles. He was recalled by Louis XVI., again became president of the council of state, restored the exiled parliaments, called Turgot and Necker successively into the ministry, but sacrificed them when they became his rivals, and by his fickle and frivolous administration hastened the catastrophe of the French revolution. Instead of serious efforts to save the government, he opposed reform with bon-mots and epigrams. The *Mémoires du comte de Maurepas* were published by the abbé Soulavie (4 vols., Paris, 1792). They consist of materials which his secretary Sallé is supposed to have collected under his directions.

MAURICE, count of Nassau and prince of Orange, stadtholder of the United Dutch Provinces, born at Dillenburg, Nov. 14, 1567, died at the Hague, April 23, 1625. He was the 2d surviving son of William I. of Orange, surnamed the Silent, by Anna, the daughter of Maurice of Saxony. Maurice of Nassau was 17 years of age when his father was assassinated at Delft by Balthasar Gérard, a Burgundian fanatic (1584), and in spite of his youth was soon after proclaimed governor and captain-general by the states of Holland and Zealand, his elder brother Philip William having been carried by the duke of Alva to Spain, where he was educated in the Catholic religion. The celebrated grand pensionary Barneveldt, who managed the diplomatic affairs of the United Provinces, was equally attached to the freedom of his country and to the interests of the house of Orange; but yielding to the pressure of circumstances he opposed neither the ineffectual offer of the sovereignty of the states to the king of France, nor another to the queen of England. The latter, without assuming the proffered dignity, promised aid against the common enemy, Philip II. of Spain, and appointed her favorite Leicester governor and captain-general of the republic. Maurice, though commencing his military career under the control of the count of Hohenlohe, was elected in 1587, by the states, to fill the same dignity during the absence of Leicester, who had made himself generally detested, and, after the recall of the latter by Queen Elizabeth, was acknowledged as stadtholder and commander-in-chief by all the provinces, Lord Willoughby commanding the English auxiliary forces. Opposed to the greatest captain of that period, the duke of Parma, Philip's governor of the Netherlands, who in 1585 took Antwerp, Maurice soon proved worthy of such a rival; and the frequent expeditions of the duke into France, where Spain supported the league against both Henry III. and Henry IV., afforded ample opportunity for advantages over the enemy. In 1590 he covered himself with glory by the surprise and capture of Breda, and in the following year took Zutphen, Deventer, Nimeguen, and

other places. The conquest of Gertruydenberg (1593) and Groningen (1594), after protracted sieges, manifested still more clearly his abilities; and his camp soon became, like that of the duke of Parma, who died in 1592, one of the great schools of the military art, to which warlike youths flocked from every Protestant country. The two fortresses fell before the eyes of the successors of Farnese, one general, though with superior forces, being unable to break the prince's lines before Gertruydenberg, and another not even attempting to rescue the gallant defenders of Groningen. In these and many subsequent conquests, Maurice was assisted by the English auxiliary troops under Sir Francis Vere, and he was still more indebted to the aid of the latter in his first battle in the open field, before Turnhout in Brabant, where he routed the Spaniards and compelled the fortress to surrender (1597). In the following year Philip II. of Spain died, having bestowed the sovereignty of the Netherlands upon his daughter Isabella, betrothed to the archduke Albert of Austria. Philip III. conscientiously executing the will of his father, Albert assumed the government in Brussels, and demanded from the United Provinces a voluntary submission to their new rulers. The republic answered only by a more vigorous prosecution of the war by land and sea. Maurice routed the archduke at Nieuport near Ostend (1600), the issue of the battle being long disputed, and the English under Sir Francis Vere claiming the principal honor of the victory. The Protestant army, however, was exhausted, and Albert was allowed to resume the field with superior forces, and to commence the siege of Ostend, while Maurice successively laid siege to other places. The resistance of Ostend was heroic, and lasted for more than 3 years; but when the Italian Spinola, who was now to dispute with Maurice the glory of being the first general in Christendom, took the command of the besieging army, all efforts to save the fortress proved vain, and an honorable capitulation ended the struggle, which had cost the king of Spain no fewer than 80,000 men. Maurice had in the meanwhile achieved numerous conquests, which more than balanced the loss of Ostend; while the exertions of the republic on the sea, both in the East, where the conquest of the Spice islands was commenced, and in America, were of equal importance. The colonial possessions of Spain and of Portugal were successfully attacked, the latter country having been conquered by the former; the Dutch East India company was founded; and the commerce of the seas was wrested from the enemy. Spinola himself advising peace, Philip III. finally yielded, and a truce for 12 years was concluded at the Hague (1609), under which the Dutch retained their liberty and conquests. This termination of the struggle was owing chiefly to the diplomacy of Barneveldt, Maurice resisting it, from ambition, to the last. Bent on usurping supreme power, Maurice was ready to sacrifice the interests of his country in order to retain

his command; and when checked by the energy of the veteran statesman, he eagerly sought for his destruction. The son of William the Silent, having achieved immortal glory by his military genius, which made him the founder of modern tactics, now stained the fame of his house by atrocious conduct toward its noblest benefactor. The religious conflict of the Gomarists and Arminians served as a means. Maurice hypocritically flattered and excited the passions of the former, while Barneveldt adhered to the latter. The synod of Dort was convoked (1618), a mock trial was held, and his religious and political opponent perished on the scaffold (1619). Grotius and others were thrown into prison. A son of Barneveldt, who undertook to avenge his father, was executed. The people, however, awakening to a feeling of shame and regret, now punished Maurice by unconcealed detestation, and he thus entirely lost the fruit of his crimes. Only the renewal of the war after the expiration of the truce (1621) restored him to popularity. He compelled his great rival Spinola to raise the siege of Bergen-op-Zoom (1622), for the conquest of which he had sacrificed 10,000 of his best troops, but was unable to rescue Breda, his grief on the fall of which (1625) is believed to have caused his death. His elder brother having died, as restored prince of Orange, in 1618, the younger, Frederic Henry, succeeded as stadtholder.

MAURICE OF SAXONY. See SAXE.

MAURICE, JOHN FREDERIC DENISON, an English clergyman and author, born in 1805. He is the son of a Unitarian minister, conspicuous for his learning, benevolence, and activity in promoting Christian enterprises, and was sent at a comparatively early age to Trinity college, Cambridge, where he contracted a friendship with John Sterling, only interrupted by the death of the latter, and which was more closely cemented by their marriage to two sisters. At the university he enjoyed a considerable reputation for scholarship, and passed his examinations with so much distinction that he was recommended to the authorities for a fellowship, which he declined on the ground that, being a dissenter, he could not sign the 89 articles of the church of England, and take a degree. It was then proposed to him to keep his name on the college books for a year or two, on the supposition that within that time his scruples might be overcome; but he steadfastly refused, and left the university without taking a degree. Repairing with his friend Sterling to London, he embarked in a literary career, was for some time connected with the "Athenæum," then recently established by J. S. Buckingham, and published a novel entitled "Ernest Conway." At the end of two years he experienced such a change of religious sentiment as induced him not merely to become a member of the church of England, but a candidate for holy orders. From apprehension, however, that his motives in taking this step might be misinterpreted, he took his degree at Oxford instead of Cambridge, and

about 1828 received ordination. Entering upon his new duties with the purpose of making the theology of his church minister to the social wants of the people, he has since pursued a career of activity and usefulness in that direction, although, from the peculiar nature of his doctrinal views, he has encountered much opposition. Allying himself from the outset with that movement in the established church now known as the "Broad Church" party, and of which Dr. Arnold of Rugby was the acknowledged pioneer, he has since the death of the latter been commonly regarded as his successor in its leadership. His personal influence, remarkable in his university career, has secured the party many adherents; and his numerous writings, nearly all of which are devoted to the exposition of "Broad Church" views, have been widely circulated in Great Britain and America. Prominent among these are his "Theological Essays" (8vo., London, 1853; republished in New York, 1854), which, from their supposed heterodoxical ideas of the atonement and eternal punishment, were severely attacked in many quarters, and ultimately cost him the professorship of divinity which he held in King's college, London. Among others, Dr. Candlish of the Scottish church combated his views in a sermon delivered in Exeter hall, and subsequently published under the title of "Examination of Mr. Maurice's Theological Essays." His other most important works are: "The Kingdom of Christ: Hints on the Catholic Church;" "Sermons on the Lord's Prayer;" "The Doctrine of Sacrifice deduced from the Scriptures;" "Lectures on the Ecclesiastical History of the First and Second Centuries;" "Prophets and Kings of the Old Testament;" "Patriarchs and Lawgivers of the Old Testament;" "The Unity of the New Testament;" "Christmas Day, and other Sermons;" "Religions of the World;" "Sermons on the Prayer Book;" "The Church a Family;" "Sermons on the Sabbath Day;" "Philosophy anterior to the Time of Christ;" "Philosophy of the first Six Centuries," and "Philosophy of the Middle Ages," which were enlarged from the pages of the "Encyclopædia Metropolitana," where they first appeared; "Lectures on National Education," &c. Not less remarkable than his efforts in behalf of "Broad Church" doctrines has been his advocacy of what is popularly known as "Christian socialism," in which he has found an able and enthusiastic colleague in the Rev. Charles Kingsley. Believing that their sacred office imposed upon them the duty of promoting the social and material as well as the spiritual welfare of the people, they coöperated with other earnest men in establishing associations of artisans and laborers, who, by undertaking work in common and sharing the proceeds, might be able to overthrow the system of competitive labor which kept them down, and thus gradually develop their intellectual resources and improve their social standing. With a view of preparing working men for these new duties and rela-

tians, he founded a workingmen's college in London, to which of late years he has devoted much time and attention. His efforts in behalf of female education deserve no less honorable mention. His views on social questions have encountered opposition as decided as his theological opinions, and few persons in England holding ecclesiastical office possess warmer friends or more determined adversaries. Of the attachment manifested to him by the former an instance is afforded in the poetical epistle of Alfred Tennyson, inviting him to the isle of Wight. For several years he has held the office of chaplain to Lincoln's Inn, whither his sermons attract large numbers of hearers; and he has recently (1860) been appointed by the queen incumbent of the district church of Vere st., Marylebone. His latest publications are a reply to Mansel's Bampton lectures (1859) and "Parochial Sermons" (6 vols. 8vo., London, 1860).

MAURIOE, THOMAS, an English clergyman and author, born in Hertford about 1755, died in London, March 30, 1824. He was graduated at Oxford, ordained, and appointed curate of Woodford in Essex. During the early part of his career at the university he had produced a metrical translation of the *Œdipus Tyrannus* and several original poems; but having subsequently become a pupil of Mr. Scott (afterward Lord Stowell), he imbibed from his preceptor a strong predilection for historical research. In 1785 he resigned the curacy of Woodford, and accepted a small pastorate at Epping for the sake of greater leisure. In 1799 he received the appointment of assistant librarian to the British museum. His principal works are: "Indian Antiquities" (7 vols. 8vo., London, 1791-'7); "History of Hindostan" (3 vols. 4to., 1795-'9); "Modern History of India" (2 vols., 1802-'4); and "Memoirs" (3 vols., 1820-'2).

MAURICIUS, FLAVIUS TIBERIUS, a Byzantine emperor, born in Arabissus, Cappadocia, about 539, assassinated Nov. 27, 602. Descended from an ancient Roman family, he passed his youth in the camp and at the court of Justin II., and on the accession of Tiberius in 578 was appointed to conduct the war against the Persians. In 580 and 581 he totally overthrew the Persians in two pitched battles, and returned to Constantinople in triumph. On the death of Tiberius in 582, after proposing Mauricius for his successor, the latter ascended the throne amid universal rejoicing. The Persians immediately renewed the war, and twice defeated the Byzantine commander-in-chief on their borders. Mauricius sent out his brother-in-law Philippius, who gained a great victory at Solaoon in 586, and soon after suffered a total defeat in Arzanene. Philippius was deposed, but contrived to raise a mutiny, by which he regained the command only to give new proof of his incompetency; he was again deposed, and Heraclius retrieved the Roman fortunes by the victory of Sisarbene and by the recapture of Achas. The war which succeeded between the Turks and Persians gave relief to the Roman arms. The Persian king

Chosroes II., being driven into exile, took refuge in the Roman territory, and wrote a letter to Mauricius imploring aid. The emperor gave him a large sum of money, and sent a powerful army under the command of Narses for the invasion of Persia. The Persian rebel Bahram was decisively defeated at Balarath, Chosroes was restored to his throne (591), and from this time till the death of Mauricius there was peace between Persia and the empire. The war with the Avars succeeded, which first broke out in 587. After one defeat the barbarians refrained from any incursion for 5 years. When they again threatened the empire, Mauricius intended to put himself at the head of the army; but it was already the Byzantine custom for the emperor not to command in the field, and yielding to the remonstrances of the senate, he sent Priscus as a substitute. He was unsuccessful, and was superseded by the emperor's brother Peter, and the latter soon after by Commeniolus, who suffered a disastrous defeat, in which 12,000 Romans were made prisoners by the Avars, and engaged in treacherous intrigues, when the fortune of the war was restored in 5 successive battles by Priscus, who was again placed in command. In 602 he was ordered by Mauricius to pass to the northern side of the Danube into the Avarian territory. The troops, already alienated, were prepared for mutiny. The emperor had allowed the prisoners taken by the Avars to be put to death rather than to ransom them, the reason probably being that they were the mutinous and dangerous soldiers of Commeniolus. The troops of Priscus now complained that they were destined to destruction like the 12,000 prisoners, organized a rebellion, made Phocas commander-in-chief, and marched toward Constantinople; and while an insurrection arose in the city, Mauricius escaped with his family by sea, took refuge in the church of St. Autonomus, near Chalcedon, and despatched his son to Chosroes to ask him in turn for aid in the recovery of his throne. The emissaries of Phocas, who had been proclaimed emperor, found him in the sanctuary, and dragged him thence to the scaffold. Five of his sons were executed with him, his eldest son Theodosius soon after, and the empress and 3 of her daughters were imprisoned and afterward put to death. He was distinguished for habits of self-control, affection, and piety. He strictly enforced beneficial laws, protected art and learning, and wrote a treatise on the military art which still exists.

MAURITANIA, or MAURETANIA, in ancient geography, the N. W. coast of Africa, including the modern Morocco and part of Algeria. It was bounded N. by the Mediterranean, E. by the river Ampsaga, which separated it from Numidia, S. by the Atlas mountains, and W. by the Atlantic. This region from the earliest times was inhabited by a people whom the ancients called Mauri (Moors), that is, blacks or negroes, who were of Numidian race, and were divided into many tribes. They first became known to the Romans when the latter in

their contests with the Carthaginians had carried the war into Africa. In the Jugurthine war Bocchus, king of Mauritania, was conspicuous, and his sons Bogudes and Bocchus were confirmed as joint kings of the country by Julius Cæsar in 49 B. C. In A. D. 42 the Romans divided the kingdom into two provinces separated from each other by the river Malvaor Malucha; the western province was called Mauritania Tingitana, and the eastern Mauritania Cæsariensis. The Romans founded in these provinces 21 considerable colonies, and introduced into the population a large element of Italian origin. In 429 the Vandals, led by Genseric, conquered Mauritania; but in 534 it was reconquered by Belisarius, and remained a province of the empire till it was overrun and subdued by the Mohammedan Arabs in the latter part of the 7th century. (See MOORS, and MOROCCO.)

MAURITIUS, or ISLE OF FRANCE, an island belonging to England, in the Indian ocean, between lat. $19^{\circ} 58'$ and $20^{\circ} 32' S.$, and long. $57^{\circ} 17'$ and $57^{\circ} 46' E.$, about 480 m. E. from Madagascar, 90 m. N. E. from Réunion, and 2,327 m. from the Cape of Good Hope; length N. and S. 36 m., breadth 32 m.; area, 676 sq. m.; pop. in 1856, 238,363, about $\frac{1}{4}$ of whom were males. The island is divided into 11 districts, named Poudre d'Or, Pamplemousses, Flacq, Rivière du Rempart, Trois Islets, Grand Port, Savane, Quartier Militaire, Moka, Plaines Wilhems, and Plaines St. Pierre. There are several straggling villages and military posts throughout the island, but the only towns of any importance are Mahébourg and Port Louis, the latter of which is the capital and the port from which all the foreign trade is carried on. The population is made up of various Asiatic, African, and European races, and of every conceivable admixture of them all. It is rapidly increasing by the immigration of laborers from Hindostan.—There are numerous capes and bays along the shore, and the island is encircled by coral reefs at various distances, but generally parallel to the land. In these reefs there are 11 passes, by the greater number of which vessels of considerable tonnage may enter and find good anchorage within. The rivers of the island are of little importance; in the rainy season they are swollen into torrents, while in the dry they are little more than brooks. One of the natural curiosities is the lake called Mare aux Vaconas, or Vaquois, named from the vaquois or screw pine (*pandanus utilis*), which abounds in the district, and with which it is encircled. Many streams flow into it; it is more than a mile in length, and in some places 25 fathoms deep, and is well stocked with crawfish, prawns, eels of enormous size, and a small red fish originally brought from China. There are two other smaller lakes near the centre of the island. Mauritius is exceedingly picturesque in appearance, and is thought by some to surpass even Tahiti in this respect. The island is intersected by 8 principal chains of mountains with spurs radiating to the coast. These mountains vary

from 1,800 to 2,800 feet above the sea, are well wooded, and many of them of very singular form. The most remarkable is Peterbote, 2,520 feet high, terminated by a spire of naked rock, on the top of which rests an immense mass of stone, larger than the point on which it is balanced. The summit of another, called the Pouce from its resemblance to the human thumb, is 2,484 feet high. There are many curious caverns, of considerable extent, in some of the ranges. In the centre of the island, on an elevated plateau, there is a mountain of a sugar loaf form called Piton du Milieu. The land rises gradually from the shore to the interior, and the N. end is more elevated than the S. The island presents numerous appearances of volcanic origin, and it has been conjectured that the principal crater must have been in the centre, the dome of which having fallen in, the Piton was thrown up by the last exertion of subterraneous force. The rocks rise in strata from the shore to the centre of the island, upon which there are many mountains composed of ferruginous rocks and grayish lava. Rich iron ore is very abundant, and at one time the mines were extensively worked.—The heat of the weather upon the coasts from November to April is very great, but in the central or elevated parts of the island it is much more moderate. In the interior the mean height of the thermometer in the middle of winter, July, was 67° , and in February, the middle of summer, 76° ; but at Port Louis it averages from 7° to 10° higher throughout the year. The windward side of the island, in the neighborhood of Mahébourg, has a lower temperature by several degrees than the leeward about Port Louis, owing to the cooling influence of the S. E. trade wind. The average annual fall of rain at Port Louis is 39.25 inches. The rainy season is from January to April, but showers are frequent at all times, particularly in the interior. Between December and March the island is subject to hurricanes, for which its neighborhood is famous. In 1778, during one of these storms, the church and about 800 houses were destroyed at Port Louis; and on the opposite side of the island the sea rose 45 feet. In Feb. and March, 1817, two hurricanes did immense damage to the plantations and shipping, and caused the loss of many lives. Some years ago a small house upon Signal mountain, inhabited by two men whose business was to attend to the signals, was blown into the sea, about a mile distant, by a violent hurricane, and neither the men nor a vestige of the house were ever seen again. To guard against a repetition of this misfortune, a residence for the men on the lookout for shipping has been excavated in the solid rock, and a roof attached by strong iron chains. The mortality among the troops is very little greater than that of Europe, and does not much exceed 8 per cent. per annum.—The chief production is sugar; coffee and rice are grown, but in small quantities, not sufficient for the consumption of the colony. Indigo, cotton, and spices

have been successfully cultivated. The native timber is of excellent quality and considerable variety, including ebony, oak, ironwood, and a kind of pine. The indigenous fruits are of little value, and are chiefly those of the ebony and palmiste; but guavas, 18 kinds of bananas, peaches, pineapples, mulberries, and strawberries are raised on most of the plantations. The government botanical gardens at Pamplemousses, established by M. Poivre, the governor, about 80 years ago, are remarkable for their varied productions, and contain the richest and rarest plants of the East. Deer and wild hogs and goats are abundant in the mountains, and short-legged hares are numerous in the plains. Apes are to be found in the forests, and are frequently used as food by the negroes. There are great numbers of rats, which prove exceedingly destructive, and mice are common. The birds of the island are not numerous, and are mostly of the smaller tribes. The only bird of prey is a species of hawk. There are partridges, wood pigeons, and doves, and in the marshy spots a kind of water hen. The dodo formerly inhabited Mauritius and the neighboring island of Réunion. The martin was introduced from Asia for the purpose of checking the increase of insects, which it has completely effected. There is still, however, a considerable variety of beautiful insects on the island, butterflies, caterpillars, moths, great numbers of grasshoppers, wasps, and wild bees. A most destructive insect, called the *kakerlac* (*blatta Americana ferruginea*) is one of the greatest pests of the island, attacking every kind of substance, leather, binding of books, and provisions. Ants infest every place, and one kind occasions great damage to trees and wood work. There are no serpents, nor any venomous insects, except a small species of scorpion and centipede. The fish on the coast are abundant and excellent; and there is a great variety of crabs and mollusks. The lobster attains a prodigious size. The sea slug so highly esteemed in China is found within the reefs. Horses, mules, donkeys, horned cattle, sheep, and hogs are imported. In 1854 the live stock of the island consisted of 12,339 horses and mules, 12,907 horned cattle, and 17,076 sheep and goats.—About one third of the entire population are employed in agriculture, and about 8 per cent. in manufactures. From the great and unnatural disproportion of the sexes, the annual number of deaths greatly exceeds that of births; and it is recorded as a singular fact that while, as in other parts of the world, among the white inhabitants the number of boys born in a year is greater than that of girls, among the blacks the number of girls is greater than that of boys. Several thousands of Indian immigrants have permanently settled upon the island, who follow various occupations and cultivate land upon a small scale on their own account. The sugar estates are worked entirely by these people; and the satisfactory accounts of their treatment, and the considerable amount of savings taken back to their native villages by those who re-

turn to Hindostan, render the emigration to Mauritius so popular that there is no difficulty experienced in procuring any required number. On Jan. 1, 1858, the Indian population was 120,834 males and 48,670 females. During the year 1859, 44,397 Indian immigrants arrived at Mauritius, 12,754 of whom were women, or a proportion of 40.81 per cent., showing a marked improvement on the disparity of the sexes in the arrivals of former years. The other great branch of the population of the island, the liberated negroes and their descendants, looking upon plantation labor as degrading, and upon themselves as a superior race to the Asiatics, have turned their attention to raising supplies upon their own account for the markets, and to petty traffic of various sorts. In 1854 there were 167,989 acres under crops, and 54,890 uncultivated. With a view to improving the culture of the cane, an agricultural society was formed in 1853 by the principal planters. The surface of the ground being to a great extent covered with stones, renders the use of the plough impracticable, and cultivation is chiefly carried on by the hoe. Guano is extensively used as a manure, and 25,707 tons were imported within the year 1856. The fertilizing power of this manure in the production of sugar is said to be almost fabulous, converting, as if by magic, sterile wastes into luxuriant plantations. In 1845 the entire crop was 102,168,000 lbs.; and in 1855 it had reached 228,480,000 lbs., and is still steadily increasing. During the year ending Sept. 30, 1859, the exports of sugar amounted to 218,945,648 lbs., viz.: to Great Britain, 122,767,825; France, 42,554,738; Australia, 39,419,181; Cape of Good Hope, 9,887,197; other places, 4,316,702. The total crop showed an increase of about 9,000,000 lbs. over that of the previous year. The other exports, beside sugar, are trifling, and with the exception of between 1,000 and 2,000 lbs. of tortoise shell are not worth notice. The value of the produce imported into Great Britain from Mauritius in 1856 is officially stated to have been \$12,185,085. Mauritius is entirely dependent upon imported provisions, and has seldom more than a month's supply in store. In 1856 there were imported 7,817 oxen for the butchers, 53,781 tons of rice, 81,067 quarters of wheat, 9,754 tons of other grain, and 90 tons of salt meat. Grain of all descriptions and various manufactured articles come from India; cattle from Madagascar; horses, cattle, oats, and hay from the Cape of Good Hope; ponies from the Indian archipelago; donkeys from Muscat and the Red sea; mules from France and Spain; sheep from India and Africa; machinery, and almost every article used by a civilized community, from Europe and America. In the year ending Sept. 30, 1859, 797 ships arrived, of which 494 were British, 234 French, and 49 American; value of imports, \$14,956,872. A regular trade has commenced between this island and New York and Boston, and there is now a considerable consumption of American butter, cheese, preserved

meats and fruits, flour, naval stores, timber, &c.; and the traffic is constantly increasing.—The main roads of the island are good, but the by-roads are not in a satisfactory condition. Railroads have been projected, but not yet constructed. A new road has been lately made from Mahebourg which shortens the distance between that town and the capital some 5 or 6 miles, and opens up large tracts of virgin land hitherto untilled and inaccessible.—There is at Port Louis a convent with a large boarding school attached for young ladies. There is also a royal college attended on an average by nearly 800 scholars, which is supported partly by a grant from government and partly by fees paid by the pupils. In 1857 the annual grant for schools, exclusive of the royal college grant, was \$35,080. There are 1,860 scholars at the government schools; 2,285 at private schools; 89 at the school of the Christian knowledge society; and 908 at the Roman Catholic schools. The religious condition of the colony is not favorably reported upon by the Protestant bishop. There are but 6 clergymen of the established church of England, and two others of Protestant denominations; while the Roman Catholic church has a bishop and 18 priests. The whole of them are paid out of the colonial treasury. Several newspapers are published at Port Louis. Monthly communication is maintained with the rest of the world by the Australian line of mail steamers, which touch here once a month, each way, on their route to and from the Red sea.—The government of the island is vested in a governor aided by an executive council, of which the colonial secretary, advocate-general, and the second officer in command of the troops, are *ex officio* members. There is also a legislative council, consisting of 7 official and 7 non-official members; the former comprise the 8 executive members above spoken of, and the collector of customs, auditor-general, treasurer, and collector of internal revenues; the 7 non-official members are chosen from the chief landed proprietors of the island, and submitted to the sovereign of England in council for approval and confirmation. When Mauritius capitulated to the British it was stipulated that the inhabitants should preserve their religion, laws, and customs; and by virtue of this provision their codes, with slight alterations, have since been recognized on the island. There is a supreme court of civil and criminal justice, presided over by 3 judges. There is also a petty court, from which there is no appeal, for the trial of trivial crimes and offences. The revenue of the island in 1857 was \$2,256,045, which slightly exceeded the expenditures. With the exception of part of the governor's salary, and some of the expenditure for a military force (which in 1857 cost the British exchequer £74,881), the island is self-supporting.—The island of Rodrigue, the Seychelles islands, Diego Garcia, and several smaller, are dependencies of Mauritius. Rodrigue is about 800 m. to the eastward, in lat. 19° 13' S. It is 26 m. long by 12 broad, and is composed of hills,

with intervening valleys covered to a great extent with rocks and stones. The soil, however, is exceedingly fertile and productive, and the climate healthy. There is an abundance of fish around the island, but some of them are poisonous at certain seasons of the year. Several colonists from Mauritius have settled here. The Seychelles, or Mahé islands, are between lat. 4° and 5° S. When Mauritius was taken possession of by the British, this group fell into their hands along with it. Beside a number of smaller ones, the chief of the Seychelle islands are Mahé, Praslin, Silhouette, La Digue, and Curieuse, and the area of the whole group is about 50,000 acres. More than half of this area is included in Mahé, which is 16 m. long and from 8 to 5 wide, with a very steep and rugged granite mountain running through the centre. The vegetation of this island, as well as of many others of the group, is exceedingly luxuriant; and among the productions are various spices. The town of Mahé is situated on the N. side of the island; pop. estimated at about 7,000. These islands are a favorite resort for whaling vessels; all have abundance of excellent water. The most remarkable production is the *coco de mer*, so called because the nuts, weighing some 20 lbs. each, were found on the coast of Malabar long before the place of their growth was known. Tortoise shell is procured in considerable quantities. Storms are unknown; and notwithstanding their nearness to the equator the climate is agreeable, the heat being tempered by the sea breezes. Diego Garcia lies about 4° further E., and is a low coral island. It abounds with turtle, and has a few residents from Mauritius.—Mauritius was discovered by the Portuguese in 1507, who called it *Ilha do Cerné*, supposing it to be the *Cerne* of Ptolemy. They landed deer, goats, monkeys, and pigs, and kept nominal possession of it till near the end of that century. In 1598 part of a Dutch squadron, while on a voyage to Batavia, accidentally fell in with the island, which they knew only by name. Upon landing they found it thickly covered with forest trees and a most luxuriant vegetation, with an abundance of water and an astonishing number of birds. The commander changed the name of the island from *Cerne* to Mauritius, in honor of Prince Maurice; he did not leave any colony, but planted some seeds. The first Dutch settlement was made in 1644, but it was afterward abandoned; they again settled upon the island, and made it a penal establishment for criminals from their Indian possessions, but finally withdrew to the Cape of Good Hope in 1710. The French took possession of Mauritius in 1715, and called it *Ile de France*. The first regular settlement took place in 1735 under M. de Labourdonnaie, who introduced the cultivation of the sugar cane, indigo, and manioc, which he had himself brought from Brazil. He changed the port from the E. side of the island to what is now the city of Port Louis, built forts, hospitals, barracks, mills, and quays, and made roads. He returned to France,

and came back to Mauritius in 1745; and it was during his second administration that the ship *St. Geran* was wrecked, in which was lost the young lady whose story was the basis of *St. Pierre's* tale of Paul and Virginia. M. de Labourdonnaie, upon his second return to his native land, was imprisoned in the Bastille, where after remaining 8 years he was acquitted and thrown penniless on the world. He survived this ungrateful treatment about 8 years. Many troubles now visited Mauritius—hurricanes, locusts, and sickness. The English sent an expedition from India to take it; but having on the way stopped at the island of Rodrigue, the soldiers ate of the fish and were poisoned, and the expedition was abandoned. The isle of France was a source of great mischief for a long time during war to the merchant vessels of England. Its position afforded great facility for the French men-of-war and privateers to intercept the Indianmen bound to and from the ports of Hindostan. After a fruitless attempt to capture the island in 1809, the British fitted out a formidable expedition from India the year following, which proved completely successful. Port Louis, and with it the whole island and its dependencies, capitulated upon very honorable terms; the French code of laws was retained, and the garrison was sent to France with arms and equipments. At the peace of 1814 the English possession of the island was ratified, and Mauritius has since continued to be a portion of the British dominions. The subject of introducing immigrants from India was first discussed in 1834, and 75 came in that year to the island. In 1835 the emancipation act of the British parliament, passed Aug. 28, 1833, came into operation, and slavery ceased to exist in Mauritius.

MAURY, a central co. of Tenn., intersected by Duck river, by which and its tributaries it is drained; area, 570 sq. m.; pop. in 1850, 29,520, of whom 12,670 were slaves. It has a diversified surface, and the soil is fertile, particularly near the streams. The productions in 1850 were 2,016,600 bushels of Indian corn, 185,170 of oats, 74,893 of sweet potatoes, and 167,517 lbs. of tobacco. There were 20 grist mills, 14 saw mills, 10 tanneries, 53 churches, and 2,283 pupils attending schools.

MAURY, JEAN SIFFREIN, a French cardinal and orator, born at Valréas, department of Vaucluse, June 26, 1746, died May 11, 1817. The son of a shoemaker, he early showed remarkable aptitude for learning, and was educated for the priesthood at Avignon. At the age of 20 he went to Paris as *abbé précepteur*, was induced by the favorable reception of several discourses to devote himself to preaching, obtained an *accessit* from the academy for an *éloge* on Fénelon in 1770, and by his panegyrics on St. Louis in 1772 and St. Augustine in 1775 placed himself at the head of the French pulpit orators of the time. He was appointed preacher to the court, succeeded at once in pleasing the believers and the philosophers, and through the influence of the former obtained the abbey of Frénade

and the priory of Lihons, and through that of the latter a seat in the academy. In 1785 he pronounced his masterpiece of religious eloquence, a panegyric on St. Vincent de Paul. At the convocation of the states-general he was chosen to it as a deputy of the clergy, immediately took a leading part in the debates as a defender of the church, aristocracy, and royalty, and was the most daring and powerful antagonist of Mirabeau. Until the flight of Louis XVI. he opposed with preëminent skill and at constant peril, the revolutionary measures, excelling not only in impassioned oratory, but in felicitous *bon-mots*, and in familiarity with the details of war, commerce, and finance. At the close of the constituent assembly he left France, and was received with a triumph at Rome, where he took up his residence. He was made successively archbishop of Nicæa *in partibus*, nuncio to the diet at Frankfort for the election of emperor, cardinal, and bishop of Montefiascone and Corneto. On the invasion by the French in 1798 he escaped in disguise to Venice, and passed thence to St. Petersburg. Returning in the following year, he was appointed by the count of Provence (Louis XVIII.) his ambassador to the holy see, but subsequently became reconciled to Napoleon, and returned to France in 1806. He was declared a French cardinal, was consulted in ecclesiastical affairs, and elected a member of the institute, but lost the esteem of his former friends. In 1810 he was appointed archbishop of Paris, and his florid episcopal charges were subjects of ridicule, and showed no sign of the resolute energy which had made him formidable in the assembly. When the pope was taken to Savona a captive of Napoleon, he ordered Cardinal Maury to relinquish the administration of his diocese. The latter paid the penalty of his disobedience by a few months' imprisonment at Rome after the restoration, and he afterward lived in retirement. His *Essai sur l'éloquence de la chaire* (2 vols., 1810) is still esteemed.—See Poujoulat, *Le cardinal Maury, sa vie et ses œuvres* (Paris, 1855).

MAURY, LOUIS FERDINAND ALFRED, a French scholar and author, born in Meaux, March 23, 1817. He was prepared to enter the polytechnic school with reference to mathematical pursuits, but his tastes led him to engage in various general studies, and in 1836 he became attached to the royal library, which he quitted in 1838 for greater leisure. Chiefly occupied with archæology and philology, he at the same time studied medicine and was admitted as an advocate. His bibliographical knowledge caused him to be recalled to the royal library in 1840, where he continued for 4 years, when he was elected sub-librarian to the institute. In this office he rendered important services till in 1857 he was elected a member of the academy of inscriptions and belles-lettres. In the previous year he was made a chevalier of the legion of honor. His principal publications are: *Essai sur les légendes pieuses du moyen âge* (Paris, 1848); *Les fêtes du moyen âge* (1855); *Histoire*

des grandes forêts de la France (1856); *La terre et l'homme* (1856), a summary of recent geographical, ethnological, and philological researches; and *Histoire des religions de la Grèce antique* (1857 *et seq.*). He has also written a large number of articles in periodicals, and in the transactions of learned societies.

MAURY, MATTHEW FONTAINE, LL.D., an American naval officer, astronomer, and hydrographer, born in Spottsylvania co., Va., Jan. 14, 1806. His parents removed while he was still young to Tennessee. In 1825 he entered the naval service as midshipman, and was appointed to the *Brandywine*, then fitting out to convey Gen. Lafayette to France. He returned with this vessel in the following year, and made a voyage in her to the Pacific, where he was transferred to the sloop of war *Vincennes*, in which he circumnavigated the globe. During this cruise, which occupied about 4 years, and while yet a passed midshipman, he began his "Treatise on Navigation," which has passed through several editions, and is used as a text book in the navy. He was again sent to the Pacific as master of the *Falmouth*, and when that vessel was about to return to the United States was transferred to the frigate *Potomac* as acting lieutenant. In 1836 he was regularly promoted to a lieutenantancy, and received the appointment of astronomer to the South sea exploring expedition, but resigned it. In 1839, while travelling on professional duty, he met with an accident which resulted in permanent lameness and unfitted him for active service afloat. He was now placed in charge of the depot of charts and instruments at Washington, afterward known as the hydrographical office; and upon the organization and union with it of the national (now called the naval) observatory in 1844, he was made superintendent of the combined institutions. Before this time, however, Lieut. Maury had begun a series of investigations in what Humboldt has called the "physical geography of the sea," and had gathered many observations of the ocean winds and currents from the records of naval and merchant vessels. Commencing with such log books as could be collected here and there, the experience of each route as to winds, currents, &c., was carefully marked down with appropriate symbols; and afterward, as sufficient materials were obtained, the results of these mappings were reduced to numbers, a bare inspection of the symbol-covered chart being generally sufficient to indicate the proper direction for the subsequent investigation. These results were made the basis of study with the view of directing further observations. In some cases, where data were scanty or entirely wanting, special cruises have since been made to fill the vacancies, until material was collected for a systematic study of the actual course of winds and currents. In 1842 he communicated to the bureau of ordnance and hydrography a plan for supplying model log books to the commanders of vessels in the naval and merchant marines, in

which a systematic series of observations might be recorded, and for causing abstracts of these records to be returned to the department. The scheme was adopted, and in the course of 8 or 9 years he had thus collected a sufficient number of logs to make 200 large manuscript volumes, averaging each from 2,000 to 8,000 days' observations. These materials were digested and examined by a staff of officers appointed for the purpose. In 1844 Lieut. Maury made known his conclusions respecting the Gulf stream, ocean currents, and great circle sailing, in a paper read before the national institute, and printed in the "Southern Literary Messenger" for July of that year, under the title of "A Scheme for Rebuilding Southern Commerce." With the accumulation of material for his investigations, the need was felt of systematizing the observations and records themselves, particularly as ships of different nations used different methods of observation and registry. Lieut. Maury accordingly entered with zeal into a project for assembling a general maritime conference, which at the suggestion of the United States government met in Brussels in 1853, and recommended a form of abstract log to be kept on board ships of war and merchant vessels, in which a condensed and uniform statement is given of all important and noticeable facts in meteorology or the general history of winds and waves during the voyage. Cordial coöperation was obtained from the British government, the royal society of London, and the British association. The principal results of Maury's researches are embodied in the wind and current charts and the sailing directions published by the observatory for general distribution among navigators, and in more popular style in the "Physical Geography of the Sea" (New York, 1856). The charts, consisting of several independent series, as the track, pilot, storm, thermal, and whale charts, are ingeniously constructed so as to present upon simple inspection, and for every part of the ocean, the results of all previous experience there, whether of winds, storms, rain, or any other possible phenomena. Each square of 5° contains the meteorological and other history of the locality clearly expressed to the eye. In the sailing directions, the lessons deduced from the charts are expressed in numbers, giving for every great thoroughfare guides indicating the shortest and best routes. But beside these practical results there are also given here, and in the smaller work mentioned above, many theoretical investigations respecting the general course and laws of the winds and principal currents of the sea. Thus the new theory, originating with Maury, of the crossing of the trade winds at the equator, whereby the excess of evaporation in the southern hemisphere is made to supply the greater requirements of precipitation upon the dry land of the northern, is fully developed and discussed. Among the practical commercial results of these explorations are claimed to be the shortening of the passage from the Atlantic to the Pacific

ports of the United States by about 40 days, and of voyages from America to Europe in proportion; the discovery of the telegraphic ocean plateau; and the indication of good whaling grounds. In 1855 Lieut. Maury was promoted to the rank of commander. He is a member of many of the principal scientific associations of America and Europe, and has received from several foreign governments valuable testimonials of their appreciation of his services. Beside the works already mentioned, he has published "Letters on the Amazon and the Atlantic Slopes of South America;" "Relation between Magnetism and the Circulation of the Atmosphere," in the appendix to "Washington Astronomical Observations for 1846" (1851); "Astronomical Observations" (1853); and "Letters concerning Lanes for the Steamers crossing the Atlantic" (1854).

MAUSOLEUM. See **HALICARNASSUS**, vol. viii. p. 650.

MAUVE (Fr., purple mallow), one of the new dyeing materials obtained by the oxidation of aniline, a product of coal tar. It was first extracted by Mr. Perkins of England, who gave it this name; but the substance may possibly prove to be the pittaical of Von Reichenbach. It is prepared by dissolving equivalent proportions of sulphate of aniline and bichromate of potash in water, mixing and allowing them to stand some hours. A black precipitate, obtained on filtering, is washed, dried, and digested in coal tar naphtha to extract a brown, resinous substance. The coloring matter is then extracted by digestion in alcohol, and is obtained on distilling off the spirit in a copper friable mass; or it may be kept in a liquid state in alcohol. The colors it gives are a variety of shades of purple, the blue predominating in some, and the red in others. The dye is especially valuable for the permanence of the colors, the purples obtained from other sources being for the most part fugitive.

MAVROCORDATO, or **MAUROCORDATO**, a Greek statesman, born in Constantinople about 1790. Both by his father and mother, who on the outbreak of the Greek revolution became victims of the infuriated Moslems of the Turkish capital, he belonged to distinguished families, several members of which, at various periods, officiated as hospodars of Moldavia or Wallachia. He received an education befitting his connections, early developed a remarkable linguistic talent, which eventually enabled him to acquire a knowledge, beside the Greek, of the Turkish, Persian, French, Italian, English, and German languages; and in 1817 he became secretary of his uncle Caradja, hospodar of Wallachia. While acting in this capacity, he joined the secret associations which were then preparing the regeneration of Hellas. When his uncle was replaced by Sutzko, he followed him to western Europe, and lived for some time in Switzerland and Italy. Having received the news of the outbreak on the mainland of Greece in 1821, he immediately embarked to join the insurrection,

accompanied by a number of French and Italian volunteers. On his arrival in the Peloponnesus he was despatched to Ætolia, where he organized a provisional government for western Greece. He exerted himself to bring about a union of the chiefs, and when Demetrius Ypsilante withdrew from the national assembly he was elected its president, and intrusted with the elaboration of the declaration of independence (Jan. 1822). He was soon after elected *proedros* or president of the executive committee, Negris becoming secretary of state, and personally took the command in western Greece. In Missolonghi, by the gallant defence of which in 1823 he saved the Peloponnesus, he made the acquaintance and gained the friendship of Byron. Persecuted by the partisans of Demetrius Ypsilante and Colocotronis, he left Missolonghi, and after some time withdrew to Hydra, where he prevailed upon the navarchs to sail to the relief of Missolonghi. Having once more acted for some time as president of the government, he again took the field in 1824, successfully opposed the progress of Omer Vrione, and subsequently distinguished himself by the heroic defence of Navarino and Sphacteria. The intrigues of the Russian party, the principal representative of which was Colocotronis, greatly checking his activity, he gradually withdrew from public service, without neglecting however to aid the provisional government by his numerous Philhellenic connections. In England, especially, toward which he showed a persistent leaning, his influence was often of high importance. During the latter years of the presidency of Capo d'Istria, he became one of the most violent denouncers of the Russian tendencies of the government, joined the opposition movements of Miaulia, and, when the latter finally committed open acts of rebellion, was declared a traitor (1831). After the assassination of Capo d'Istria, he also opposed the measures of his brother and successor in office, Augustine. The election of the Bavarian prince Otho as king in 1832 put an end for a time to this strife of the various factions, and in the following year Mavrocordato entered the royal cabinet. The numberless difficulties of the new government, however, and particularly the dissensions which broke out between the president and various members of the Bavarian regency, compelled him to retire from the ministry in June, 1834, and he now served for a number of years as ambassador to the courts of Munich, Berlin, and London. The Turkish-Egyptian war of 1840 bringing about serious complications with the allied European powers, which had guaranteed the integrity of the Porte, while Greece was all in a ferment to take advantage of the prostrate state of her enemy, King Otho saw himself obliged to call Mavrocordato to the presidency of the ministry, with the portfolio of home affairs (July, 1841). This career was of very short duration, the English connections of Mavrocordato exposing him to the combined attacks of the native as well as foreign representatives of all other interests.

He was sent to Constantinople to conciliate the Porte. The revolution of Sept. 15, 1843, which annihilated the influence of the Bavarian companions of the king, recalled Mavrocordato from Constantinople. Together with Metaxas, the leader of the Russian, and Colettiis, the leader of the so called national or French party, he entered the new cabinet; and when both these colleagues left it, he concentrated almost all power in his hands, and became minister president of a new cabinet in April, 1844. He had in the mean time been active, as a representative in the national assembly, during the debates on the constitution, displaying a remarkable ability as an orator. The state of the kingdom, however, was almost desperate. The finances were entirely exhausted, Russia and other powers were hostile and engaged in intrigues, the factions more violently opposed to each other than ever, and the royal troops unable to check the depredations of the Klephts, and still more the insurrections which followed each other. That of Grivas in Arta could be checked only by an operation which was stigmatized as treachery. The hostility of the press provoked measures in the highest degree unpopular. Other acts of the ministry betrayed a very dangerous party spirit. It finally succumbed, in Aug. 1844, to a general outcry of indignation, and was succeeded by a ministry under Colettiis, consisting of a coalition of the national and Russian parties. The new assembly was animated by a spirit of the most decided hostility to the partisans of England, and Mavrocordato with a number of colleagues was ejected. He continued an opponent of Colettiis till the death of the latter in 1847, as well as of his successor, but in 1850 accepted the Paris embassy. The open hostility both of the king and the people to the Porte during the Russian war having caused the occupation of the Piræus by the fleet of the allies, and brought Greece upon the brink of ruin, Mavrocordato was recalled by the king, and was again placed (May, 1854) at the head of the cabinet, which he soon after left with some of his colleagues, being dissatisfied with the influence of the court. Although nearly blind, he still continues (Aug. 1860) actively engaged in the cause of education at Athens.

MAXCY, JONATHAN, D.D., an American clergyman, born in Attleborough, Mass., Sept. 2, 1768, died in Columbia, S. C., June 4, 1820. Evincing in his youth considerable intellectual precocity, he was sent at 15 years of age to Brown university, where he was graduated in 1787. The college faculty immediately appointed him to a tutorship, an office which he held for 4 years. In the mean time he studied divinity, and in April, 1790, was licensed as a preacher in the Baptist church. In Sept. 1791, he was instituted pastor of the first Baptist church of Providence, and at the same time was elected a trustee and professor of divinity in Brown university; and in the succeeding September, although but 24 years of age, he was called to the presidency of that institution.

After filling this position 10 years, he was elected in 1803 president of Union college, N. Y., whence 2 years later he went to Columbia, S. C., to accept the presidency of the South Carolina college. This latter station he occupied until his death. He was an eloquent preacher, and well versed in philology, criticism, and moral philosophy. A number of his sermons, including one on "The Existence of God demonstrated from the Works of Creation," with other literary remains, were published in 1844, preceded by a life, by Romeo Elton, D.D.

MAXIMIANUS I. See DIOCLETIAN.

MAXIMIANUS II. See GALEERIUS.

MAXIMILIAN I., emperor of Germany, born at Neustadt, near Vienna, March 22, 1459, died in Wels, Jan. 12, 1519. He was the son of the emperor Frederic III., of the house of Hapsburg, and of Eleanor, a princess of Portugal. He learned to speak a number of languages, acquired various branches of knowledge, and, spending his youth in the wars of his father with Podiebrad of Bohemia, Matthias Corvinus of Hungary, and others, became an excellent horseman, tilter, and hunter, gallant, chivalric, and adventurous. His fine and stately personal appearance, which in some features reminded one of his ancestor Rudolph of Hapsburg, also advantageously distinguished him from his slothful father. The latter, faithful to the maxim of his house to conquer by marriages, sought for him the hand of Mary, the daughter and heiress apparent of Charles the Bold of Burgundy, promising a royal crown to the duke. The parties and their parents met at Treves in 1478; but the mutual distrust of the latter respecting the fulfilment of the conditions broke off the negotiations. When 4 years later Charles perished on his flight from the battle field of Nancy, his widow Margaret rejected the offers of Louis XI. of France in behalf of his infant son Charles (afterward VIII.), telling his barber and envoy Oliver that Maria was to be married to a man, with whom she hoped to have children of her own. Soon afterward the rich and beautiful heiress became the wife of Maximilian, and in a few years the mother of two children, Philip and Margaret. But her husband neither succeeded in saving all her possessions from the rapacity of Louis XI., nor in obtaining the ready allegiance of the rich cities of the Netherlands, when on her sudden death, in 1482, caused by a fall from her horse while hunting, he claimed the regency for his son Philip. Louis was active in instigating and promoting revolts in those provinces, and Maximilian suffered still greater injury from France a few years later, when, after his election and coronation as king of the Romans (1486), having married by proxy another rich heiress, Anne of Brittany, and promised his own daughter Margaret to Charles VIII., Anne de Beaujeu, the regent of the latter, suddenly broke off both engagements, bringing Brittany with Anne into the hands of Charles, and sending back Margaret to her father. The war which ensued was of

short duration. Maximilian now married Bianca Sforza, the daughter of the murdered duke of Milan, Galeazzo Maria, receiving 800,000 ducats from her uncle and guardian, the bloody Ludovico Moro, on whom he bestowed Milan, the heritage of the brother of his bride. The wife of the lawful heir, however, a Neapolitan princess, sought for aid from her native country, and the usurper Moro thereupon prevailed on the king of France to renew the old claims of the house of Anjou to Naples, and to enter on an Italian campaign. This led to those long Italian wars, in which during Maximilian's lifetime Charles VIII., Louis XII., and Francis I. of France, Ferdinand the Catholic of Spain, the popes Alexander VI. and Julius II., the empire, Switzerland, the republic of Venice, and Naples were principally engaged. Campaigns, treaties of peace, alliances, and treacherous desertions of allies followed in rapid succession; but the details belong to the history of the more important actors, Maximilian, who in 1498 had succeeded his father as emperor, playing in the whole a secondary part, so far inadequate to his adventurous and often chimerical schemes were the meagre supplies which he was able to extort in numerous diets from the unwilling states. One of these plans was that of becoming pope after the death of Julius II. Instead of aiding their emperor, the states of Germany were always ready to complain, and the empire itself was not a little distracted by feuds, in spite of the eternal peace decreed by the diet of Worms in 1495, of the new *Reichskammergericht*, and the exertions of the Swabian confederacy for the maintenance of order. Switzerland, which was to be reconquered, now entirely detached itself from the Germanic body, whose head saw himself often deserted by his allies, sometimes by his own troops, and frequently penniless. The troubles of the reformation broke out shortly before his death. In the mean time he had not neglected to continue the safer and peaceful conquests of his house. Philip and Margaret, his only two children by Mary of Burgundy, married Juana and Juan, the children of Ferdinand of Aragon and Isabella of Castile; Philip succeeded to the throne of Castile in 1508, and died in 1506; and his son Charles, on the death of Ferdinand in 1516, inherited the whole of Spain. This young prince also became the successor of Maximilian as emperor of Germany, under the name of Charles V., his younger brother Ferdinand inheriting the German possessions of Austria, and subsequently, in consequence of other marriage connections, also ascending the thrones of Hungary and Bohemia. Having also succeeded Charles V. in the empire, Ferdinand I. left all his thrones to his good-natured but feeble son Maximilian II. (1564-1576). Maximilian I. left a number of treatises on military science, gardening, the chase, and other subjects, and a poetical work on his own life.

MAXIMINUS, CARIUS JULIUS VERUS, Roman emperor, born in Thrace toward the close of

the 2d century, killed before Aquileia in 288. He was the son of a Goth by an Alan woman, and was brought up as a shepherd. During the passage of the emperor Septimius Severus through Thrace, on his return from the East, he attracted the attention of that monarch by marvellous feats of strength and agility, as well as by his gigantic stature, being upward of 8 feet in height, and eventually able to wear the bracelet of his wife as a ring on his finger. Admitted to the army, though a barbarian, he rose from rank to rank, gained the admiration of his fellow soldiers by valor equalling his strength, and after several reigns succeeded in supplanting the virtuous Alexander Severus, on whose assassination by the soldiers in Gaul he was proclaimed emperor (285). He appointed his son Maximus to the dignity of Cæsar. Though successful in his almost continual wars against the Germans, the imperial barbarian, who is said to have eaten 40 pounds of meat and drunk an *amphora* of wine a day, was tormented by a sense of insecurity, and in order to preserve his power stained his reign with cruelties which surpassed those of his previous masters, Caracalla and Elagabalus. He spared none whom birth or merit exposed to suspicion. In consequence of an alleged conspiracy, Magnus, a senator, with 4,000 others, was put to death. Simple death was regarded as a favor. His rapacity was no less disastrous than his cruelty, and he finally sunk under the general indignation of the provinces aroused by a wholesale confiscation of municipal property for the use of the imperial treasury. The insurrection broke out in Africa, where the two Gordians were proclaimed emperors. These perishing soon after, the senate proclaimed Maximus and Balbinus their successors. Maximinus, who had his winter quarters on the lower Danube, hastened to Italy, crossed the Alps, and besieged Aquileia, but was soon murdered, together with his son, by his own soldiers.

MAY (Lat. *Maius*), the 5th month in the Gregorian calendar, consisting of 31 days. The name is of uncertain origin. Ovid suggests its derivation from either *majestas*, *majores*, or *Maia*, the mother of Mercury; and others think it a Teutonic word. Among the Romans it was sacred to Apollo, and almost every day was a festival. On the 9th, 11th, and 18th days was celebrated the festival of the *lemuria* in memory of the dead, and consequently it was believed that marriages contracted in this month would soon result fatally. Traces of the same superstition still exist, as in the French proverb: *Noces de Mai, noces de mort*. From the ancient *Floralia*, or festival in honor of Flora, celebrated from April 28 to May 2, is perhaps derived the mediæval and modern custom of observing May 1 (May-day) with festive and floral rites. The druids also were accustomed to light large fires upon the summits of hills on the eve of May. From the time of Chaucer references to May-day festivities are common in English poetry. In the "Knights Tale," on May morning:

Fourth goeth al the court, both moete and leste,
To seche the floures freshe, and braunch and blome.

Polydore Vergil says that it was usual to adorn not only houses and gates, but also churches, with boughs and flowers. Hall mentions in his "Chronicle" that Henry VIII. rode a-Maying with Queen Catharine and many lords and ladies from Greenwich to the high ground of Shooter's hill; and he adds that it was customary for the citizens of London to join together and have their several Mayings, with May poles, warlike shows, arches, morris dancers, and other devices. Milton wrote a song on May morning, and Shakespeare and Herrick frequently refer to its observance. Robin Hood and Maid Marian, the queen of the May, are associated with the traditions of May games.

MAY, CAROLINE, an American authoress, is the daughter of the Rev. Edward Harrison May, for many years pastor of one of the Dutch Reformed churches of New York, of which city she is a resident. She has edited "American Female Poets" (1848), with numerous biographical and critical notes; "Treasured Thoughts from Favorite Authors" (12mo., 1851); the "Woodbine" (1852), an annual, &c.; and has produced occasional poems and prose essays.

MAY BUG. See COCKCHAFFER.

MAYENOE. See MENTZ.

MAYENNE. I. A N. W. department of France, formed from the old province of Maine, bounded N. by La Manche and Orne, E. by Sarthe, S. by Maine-et-Loire, and W. by Ille-et-Vilaine; area, 1,998 sq. m.; pop. in 1856, 878,841. The surface is rugged and diversified. Iron, coal, and slate are found. The river Mayenne traverses the department from N. to S. The climate is mild and healthful. The soil, except in the S. districts, is not fertile, but the greater part of it is under cultivation. The chief manufactures are linen, canvas, cotton, and paper. The principal towns are Laval, the capital, Mayenne, and Château-Gontier. II. A river of France (anc. *Meduancq*), which rises in the department of Orne, and, after a S. course of over 120 m., unites with the Sarthe to form the Maine (7 m. long) near Angers. Its chief tributary is the Varenne. The river is navigable from Laval to the junction of the Maine with the Loire, about 55 m.

MAYER, BRANTZ, an American lawyer and author, born in Baltimore, Md., Sept. 27, 1809. Educated at St. Mary's college, Baltimore, after leaving that institution he sailed for the East, visiting Java, Sumatra, and China, and returned in 1828. He entered on the profession of the law in 1832, practising until 1841, and in that year, having visited Europe meanwhile, was appointed secretary of legation to Mexico, where he remained one year. Since his sojourn there he has devoted some time to literature as well as to his profession, and for a short period edited the "Baltimore American" newspaper. His first book, "Mexico as It Was and as It Is," was published in 1844, and was followed by a more elaborate work, "Mexico—Aztec, Spanish, and

Republican" (2 vols. 8vo., 1851). In 1854 appeared "Captain Canot, or Twenty Years of an African Slaver," written from the notes, journals, and conversations of Canot himself. Mr. Mayer has also written "Observations on Mexican History and Archæology, with a Special Notice of Zapotec Remains, as delineated in Mr. J. G. Sawkins's Drawings of Mitla," &c., published in the Smithsonian "Contributions to Knowledge" (Washington, 1856), and another work on "Mexican Antiquities" (Philadelphia, 1858). His occasional addresses have been numerous, and he has contributed to the Maryland historical society, of which he was corresponding secretary, the "Journal of Charles Carroll of Carrollton during his Mission to Canada," "Tah-gah-jute, or Logan and Captain Michael Cressap," &c.

MAYER, JOHANN TOBIAS, a German astronomer and mathematician, born in Marbach, Württemberg, Feb. 17, 1728, died in Göttingen, Feb. 20, 1762. His knowledge of elementary mathematics was derived from his father, a civil engineer; but the rest of his education was self-acquired. He gained a living, when a mere youth, by teaching mathematics. His first scientific production, "A Treatise on Curves for the Construction of Geometrical Problems," appeared in 1745. The university of Göttingen in 1751 chose him its professor of mathematics, and appointed him director of its observatory. His "Zodiacal Catalogue," comprising 998 stars, is of the very highest authority; and his "Lunar Tables," published in 1755, were deemed of such value by the English astronomer royal that the British parliament awarded his widow £3,000. The most important of Mayer's discoveries was the principle of the "repeating circle," employed by Borda in measuring the arc of the meridian.

MAYFLY, an insect generally placed in the order *neuroptera*, with the dragon flies, ephemeræ, myrmeleon, and termites or white ants, forming the genus *phryganea* as restricted by Latreille. The jaws are hardly perceptible; the lower wings are broader than the upper, and longitudinally plaited; they have no sting nor piercer, and the antennæ are as long as the body; they undergo complete transformation, the larvæ and pupæ living in the water and feeding on aquatic insects and plants. The eggs are laid on the leaves of willows and other trees overhanging the water, attached by a viscid matter; the small 6-footed larvæ, when hatched, fall into the water, and there form for themselves cases of bits of straw, wood, leaves, stones, and shells, cemented together by a glutinous silk; they are hence called case or caddis worms; the larva protrudes its head and shoulders from the case when searching for food; the manner in which these cases are made, ballasted, and balanced, affords a striking example of insect architectural ingenuity. (See Rennie's "Insect Architecture.") The pupa is incomplete, and is enclosed in the larva case, at one end of which is a silken grating through which

the water for respiration is admitted and ejected; just before quitting the case the grating is out through by a pair of curved mandibles, and the insect leaves the water by means of the 4 anterior legs, which are unconfined, to assume the perfect state. The flies as well as the larvæ are greedily eaten by fish, and are well known to anglers, who imitate the perfect insects by colored feathers as bait for trout, grayling, &c. Mayflies fly heavily, and generally alight on bushes near the water's edge; most of them are of a brown color, with cinereous, greenish, and yellowish markings; they include the willow, alder, green tail, and dun flies, which cover the surface of the water during the cloudy days of spring, affording plentiful food for fish; as the season advances they appear chiefly in the morning and evening, and during the heat of summer are principally nocturnal. About 800 species are described, one of the largest of which is the *P. grandis* (Linn.) of Europe, nearly an inch long, with a spread of about 2 inches; the upper wings are brownish gray with cinereous spots, and the antennæ as long as the body. Kirby established the order *trichoptera* for these insects, which present some peculiarities connecting them with *lepidoptera*; the larvæ resemble the moths in making cases; the perfect insects have the wings hairy but scaleless, without reticulations, and the under ones folded longitudinally; the antennæ are like those of moths, and the tibiae are often armed with the 2 pairs of spurs observable in the latter; but they have not a spiral tongue, and the head has 3 single eyes as well as the usual compound ones; the abdomen is never furnished with terminal setæ. There are some of the *pyralides* or delta moths, in the larva state living in leafy cases under water, and feeding on aquatic plants, which seem to make a transition to the *trichoptera* or this division of the *neuroptera*.—Another neuropterous insect, of the subulicorn family and genus *ephemeræ* (Linn.), is also called mayfly; the lower wings are much smaller than the upper, and both are carried perpendicularly; the abdomen is terminated by 2 or 3 setæ; the antennæ are short, and the body is soft, long, and tapering. These frail creatures appear in the winged state toward evening in summer, often in immense numbers; the *E. albipennis*, a European species, with white wings, occurs sometimes in such abundance in midsummer as to remind one of a snow storm. The larvæ are aquatic, and excavate burrows in the banks of streams under water, in which they are safe from fishes and yet amply supplied with food; after changing their skins several times they become nymphs, with the long caudal appendages and lateral fringes of the larvæ, but with rudimentary wing cases in addition; after attaining the winged state, they cast off a complete envelope of skin. Passing a year or two in their imperfect condition, they assume their perfect shape and sport for a few days, perhaps for a few hours only, in the summer day or evening.

They are good emblems of the fleeting pleasures and life of man, and have so been frequently employed in verse and prose. Swammerdam, Réaumur, and De Geer have written fully upon their aerial dances in a very interesting manner. The fishermen of France call them *manna* from their furnishing abundant food for fish, covering as they do the surface of the water with their countless swarms in August. (See Rennie's "Insect Transformations.") These are generally called day flies, and are imitated, like the preceding, as baits for river fish.

MAYHEW, the name of several brothers distinguished in contemporary English literature. I. HENRY, born in London, Nov. 25, 1812, was educated at Westminster school, and after a somewhat irregular course of life established himself in London as a literary man. In 1841 he was engaged in founding the comic periodical "Punch" (which was preceded by "Figaro in London," also started by himself), and for some years was its chief editor. A disagreement with the proprietors caused him to retire from this position, and he has since devoted himself to the preparation of original works published under his name. His chief publication is "London Labor and the London Poor" (2 vols. 8vo., 1851), a work commenced in the columns of the London "Morning Chronicle," but left incomplete in consequence of involvement in legal proceedings from causes over which the author had no control. In conjunction with his brothers Horace and Augustus, the former of whom has for many years been attached to the staff of "Punch," he has also aided in the production of a series of humorous novels and Christmas stories by the "Brothers Mayhew," including "The Greatest Plague of Life, or the Adventures of a Lady in Search of a Husband;" "Whom to Marry and How to get Married;" "The Image of his Father;" "The Good Genius that turned Every Thing into Gold;" "The Magic of Kindness," &c. Under his own name he has published two interesting juvenile books, entitled "The Story of the Peasant-Boy Philosopher," founded on the life of James Ferguson, and the "Wonders of Science," founded on that of Sir Humphry Davy. He has also produced an anonymous work, entitled "The Mormons, or Latter-Day Saints, a Contemporary History" (1852). II. EDWARD, born in London in 1813, was during his youth the manager of a strolling company, and in that capacity wrote the farce of "Make your Wills." He has published a valuable manual on the "Management and Treatment of Dogs," "Treatise on the Mouth of the Horse," and the "Illustrated Horse Doctor" (London, 1860). III. THOMAS, born in 1810, was one of the first to prepare cheap publications for the poorer classes, and started a number of "penny dictionaries," "penny grammars," and similar works, forming the "Penny National Library." He was at one time editor of the "Poor Man's Guardian," which during the agitation of the reform bill encountered the opposition of government in consequence of its

radical opinions. IV. HORACE, beside sharing largely in the authorship of the books by the "Brothers Mayhew," has published several humorous works under his own name, including "The Toothache, imagined by Horace Mayhew, and designed by George Cruikshank," "Letters left at the Pastry Cook's," &c. V. AUGUSTUS had an equal share with Horace in the production of the "Brothers Mayhew" series, and has also been an industrious contributor to periodical literature.

MAYHEW, JONATHAN, an American clergyman, born in Martha's Vineyard, Mass., Oct. 8, 1720, died in Boston, July 9, 1766. He was graduated at Harvard college in 1744, and in 1747 was ordained minister of the West church in Boston, a position which he filled during the remainder of his life. He was distinguished as a preacher and a writer of controversial tracts, evincing extensive learning, and an independence of spirit which occasionally betrayed him into indiscretions. Many of his writings were republished in England, and in 1749 he received from the university of Aberdeen the degree of D.D. Among the most prominent acts of his life was his opposition to the proceedings of the British society for the propagation of the gospel in foreign parts, which involved him in a controversy with Dr. Apthorp and other divines of the church of England, including Dr. Secker, the archbishop of Canterbury. On this occasion he opposed with vigor and effect the introduction of bishops into the colonies. He coöperated with Otis and other early opponents of the arbitrary designs of the mother country, occasionally introducing his liberal opinions into his sermons with a boldness which ranked him among the ultra whigs. Among his published works may be enumerated a volume of 7 sermons (8vo., 1749); "Christian Sobriety, in 8 Sermons to Young Men;" "Observations on the Charter and Conduct of the Society for Propagating the Gospel in Foreign Parts," &c. A memoir of him has been written by Alden Bradford (8vo., Boston, 1838).

MAYNOOTH, a market town of Ireland, co. Kildare, on the royal canal, 15 m. W. N. W. from Dublin; pop. in 1851, 2,129. It has a ruined castle built in 1426 by John Fitzgerald, earl of Kildare, and is the seat of the royal college of St. Patrick, founded in 1795 by act of the Irish parliament for the education of Roman Catholics for the priesthood. The sum of about £8,000 was voted annually for its maintenance until 1808, and since that time the government grant has been gradually increased, until it is now £30,000 per annum. Beside this, more than £60,000 has been voted at different times for the enlargement of the buildings, and the college likewise possesses an income of £460 per annum from the Dunboyne estates in the county of Meath. By the act of 8 and 9 Victoria, cap. 25, passed under the ministry of Sir Robert Peel, the institution was placed on a new foundation, and endowed for the support and education of 500 students, and of 20 senior

scholars on the Dunboyne foundation. Allowances are made to 250 members of the 8 higher classes and to the 20 Dunboyne scholars. Candidates over 16 years of age, and intended for the priesthood in Ireland, are admitted on the recommendation of their bishops, and no others can be received. The faculty consists of a president, vice-president, 4 deans, a prefect of the Dunboyne establishment, who is also librarian, a bursar, 4 professors of moral and dogmatic theology, and 1 professor of each of the following branches: natural philosophy; sacred Scripture and Hebrew; ecclesiastical history; logic, metaphysics, and ethics; rhetoric and belles-lettres; humanity; English rhetoric and French; and the Irish language. Frequent attempts have been made in the British parliament to obtain a repeal of the Maynooth grant, and a motion to that effect was negatived in the house of commons, April 29, 1858, by a vote of 210 to 155. During the parliamentary session of 1857-'8, 100 petitions with 27,000 signatures were presented to parliament for the repeal.

MAYO, a maritime county of Ireland, in the province of Connaught, bounded E. by Sligo and Roscommon, S. by Galway, and W. and N. by the Atlantic ocean; greatest length 72 m., greatest breadth 58 m.; area, 2,131 sq. m.; pop. in 1851, 274,830. The coasts are indented by numerous bays and harbors, the principal of which are Killala bay on the N., and Broadhaven, Blacksod, and Clew bays on the W. The surface toward the E. is level and fertile, but the W. districts are for the most part barren and mountainous, some of the summits attaining an elevation of more than 2,500 feet above the sea. The only river of any importance is the Moy, but the lakes are numerous, the largest being Loughs Corrib, Mask, Conn, Oullin, and Carra, the two first named belonging in part to the county of Galway. The most important minerals are iron, marble, and slate; but the iron mines, though valuable, are not worked for the want of fuel. The principal manufactures are linens, flannels, woollen stockings, and straw hats. The county returns 2 members to parliament. Chief towns, Castlebar (the capital), Ballina, and Westport.

MAYO, AMORY DWIGHT, an American clergyman, born in Warwick, Mass., Jan. 31, 1823. He passed his youth till nearly 20 years of age in his father's country store, alternating with teaching in the district schools in the winter. He entered Amherst college at the age of 20, but was compelled to leave after one year on account of ill health. He then entered upon private theological studies, particularly under the direction of Dr. Hosea Ballou, now president of Tufts college, was ordained as an evangelist in School street Universalist church, Boston, and was settled at Gloucester, Mass., over the Independent Christian church. After a ministry of 8 years in Gloucester, Mr. Mayo removed to Cleveland, Ohio, and preached one year to the Congregational society of Liberal Christians. In 1855 he took charge of the first

Congregational Unitarian society of Albany, of which he is now pastor. He has published "The Balance" (Boston, 1847); "Graces and Powers of the Christian Life" (Boston, 1852); and "Symbols of the Capital" (New York, 1859); and has also prepared a selection from the writings of his wife, with a memoir (Boston, 1849), beside contributing extensively to periodicals. Some of his latest works have appeared in a serial publication, the Albany "Tracts for the Times," and are in vindication of his peculiar religious tenets.

MAYO, WILLIAM STARBUCK, an American author, born in Ogdensburg, N. Y., April 20, 1812. He was educated at the academy of Potsdam, at the age of 17 commenced the study of medicine, and in 1838 received his diploma of M.D. After practising his profession for several years, he made a tour through the Barbary States and Spain. In 1849 appeared his first work, "Kaloolah," purporting to be the autobiography of Jonathan Romer, whose imaginary adventures in Africa are described with much vigor. This has proved the most popular of his productions. He has also written "The Berber, or the Mountaineer of the Atlas" (1850), a romance of travel and adventure, similar in vein to "Kaloolah," and "Romance Dust from the Historic Placer," a collection of stories chiefly founded on historical incidents. He has been a resident of New York for some years past.

MAYOR (Lat. *major*; Fr. *maire*), the chief municipal officer in a borough or corporate town. The office arose out of the immunities granted to free cities by sovereigns in the middle ages, and in England dates from the reign of Richard I., previous to which time the chief magistrate of a town was called portreeve or boroughreeve. In England mayors are addressed as "your worship," and those of London, Dublin, and York enjoy the prefix of lord to their titles by special royal grant. In France the *maire* is the first municipal officer in each commune. The office was alternately elective or in the gift of the government until the decree of 1855, which places the appointment of *maire* in the capital of each department, arrondissement, and canton, and in communes containing 8,000 inhabitants, in the hands of the emperor; in communes of a less number of inhabitants he is appointed by the prefect of the department. Apart from his special municipal functions, he is charged, as the agent of the imperial government, with the publication and execution of its decrees, the preservation of public security, the preparation of statistics of marriages, births, &c., and with judicial power over certain minor offences. The chief executive officers of cities in the United States are termed mayors, and are elected annually or biennially by the citizens.

MAYOR OF THE PALACE (Lat. *major domus regia*, *magister palatii*), an officer of state in France under the Merovingian kings, who originally exercised the functions of royal steward, having the management of the king's es-

tates and the direction of his household. By degrees these functionaries usurped almost the entire power of the state, the king remaining such only in name, while the mayor, becoming his guardian or overseer rather than his minister, exercised his prerogatives in the interests of the feudal aristocracy. This assumption of absolute power dates from the middle of the 7th century, when the administration of Austrasia, Neustria, and Burgundy was engrossed by their mayors, Grimoald, Archambaud, and Ebrouin. Pepin, who subsequently became mayor of Austrasia, from 688 to his death in 714 ruled France with absolute sway, and was succeeded by his natural son Charles Martel, whose son Pepin, the father of the emperor Charlemagne, took the title of king, and founded the Carolingian dynasty of French monarchs. After the accession of Pepin to the throne the office lost much of its importance, or was altogether abolished.

MAYSVILLE, a city and the capital of Mason co., Ky., on the Ohio river, 68 m. S. E. from Cincinnati and 60 m. N. E. from Lexington; pop. in 1860 estimated at 7,000. It was settled in 1784, and was originally called Limestone, but received its present name in 1788 after John May, one of its early settlers. It lies on a bend of the river, and is backed by a range of hills which give it a very attractive appearance. The city has an active trade derived from a large portion of north-eastern Kentucky, and is the most extensive hemp market in the United States; it also contains numerous manufactories of cotton and hemp fabrics. Two railroads are projected, one to Lexington, and another to the mouth of the Big Sandy river, to connect with the Covington and Ohio railroad. It contains, beside the county buildings, a handsome city hall, a hospital, 2 banks (capital \$750,000), about 90 stores, 2 steam cotton factories, a large bagging factory, several iron foundries, an extensive coal oil refinery, 7 churches, and many schools.

MAZARIN, JULES (Ital. MAZARINI, or MAZARINO, GIULIO), cardinal, a French statesman, born at Piscina, in the kingdom of Naples, July 14, 1602, died in Paris, March 9, 1661. He was of a noble Sicilian family, received his early education at Rome, and afterward studied law at the universities of Alcalá and Salamanca in Spain. He embraced the military profession, and in 1625 was a captain in the papal army. Even at this early age he displayed remarkable diplomatic talent, and was employed in important negotiations with the French and Spanish commanders in Italy. He, however, soon quitted the army, and entering the civil service of the pope was attached to the suite of Cardinal Sacchetti, the papal ambassador at Turin. In 1629 the cardinal returned to Rome, leaving Mazarin at Turin, with the title of inter-nuncio, and full powers to conclude a peace. In this capacity he went to Lyons in 1630, where he was presented to Louis XIII., and subsequently to Cardinal Richelieu, who greatly admired his talents, and succeeded in attaching

him to the interests of France. In 1634 Richelieu caused him to be made vice-legat of Avignon, and in 1641 procured for him a cardinal's hat from Pope Urban VIII. After the death of Richelieu in Dec. 1642, Mazarin became a member of the council of state; and on the death of Louis XIII. in May, 1643, the regent Anne of Austria made him prime minister. He affected at the beginning of his administration much humility and moderation. He was affable and complaisant in his manners, and appeared in public without guards and without any assumption of state. In spite, however, of this cautious policy, a powerful party was soon organized against him, headed by the duke of Beaufort, the prince of Conti, the duchess of Longueville, and the wily and turbulent De Retz, archbishop-coadjutor of Paris. The people being already heavily taxed, the parliament of Paris refused to consent to a new impost, and the cardinal caused Blancmesnil, its president, and Broussel, one of its most popular members, to be arrested. Instigated by De Retz and the other leaders of the opposition, the citizens of Paris rose in insurrection in Aug. 1648, and thus began the civil war of the Fronde. Mazarin fled to St. Germain with the queen regent and the young king, and was proscribed by the parliament as a disturber of public order. Peace was restored March 11, 1649, chiefly through the influence of the great Condé, who, however, conducted himself with such arrogance that Mazarin in self-defence caused him to be arrested and imprisoned, Jan. 12, 1650, together with the prince of Conti and the duke of Longueville. The parliament espoused the cause of the princes, and issued a decree of banishment against Mazarin. As the parliament was sustained by the people, the cardinal yielded to the storm, liberated the princes in 1651, and fled himself to Germany. His influence over the queen, to whom he is supposed to have been secretly married, was so great that he still governed the kingdom from his exile; and in 1652, the excitement against him having apparently subsided, he entered France at the head of an army of 8,000 men under the authority of a passport from the queen. The prince of Condé was at this time again in rebellion, and the young king Louis XIV., who had recently assumed his majority at the age of 14, was at Poitiers with his court, and toward that city Mazarin directed his march. The news of his return to France created great commotion at Paris. The parliament hastily assembled; and although a letter from the king was read declaring his approbation of Mazarin's movements, the parliament decreed that the cardinal was a rebel, and ordered his magnificent library and other property to be sold, and from the proceeds of the sale 150,000 livres set apart as a reward to whoever should deliver him up dead or alive. The cardinal, regardless of these decrees, continued his march, and at the end of a month reached Poitiers, where he was received by the king and the whole court with the greatest demonstrations of delight. The civil war

continued for some months longer, being carried on by the princes and the parliament on the pretext that the king was a prisoner in the hands of Mazarin, whose foreign birth made him peculiarly unpopular. At length the cardinal, finding that nearly all parties were weary of the contest and only needed an excuse for laying down their arms, prudently tendered his resignation as prime minister, and withdrew from the court. His resignation being accepted, the parliament at once submitted, together with all the great leaders of the Fronde except Condé, and the king returned to the capital amid the acclamations of the people. Louis immediately began to assert his authority with vigor. He ordered Cardinal de Retz, the principal instigator of sedition, to be arrested, and sent him to prison at Vincennes. As this decided step was not resisted by the people, though it made a great sensation, Mazarin, who had meanwhile taken command of the army on the frontier, and gained some successes over the Spaniards, seized the occasion to return to Paris while his military glory was yet fresh. The king and the courtiers went out several miles beyond the walls to welcome him, and he entered the capital in triumph, in the same carriage with the king, amid the general rejoicings of the fickle Parisians, who kindled bonfires in his honor in the streets, and gave him a splendid banquet at the city hall. His first care after his return was for the public finances, which were in great disorder, and next for his own, which had suffered considerably by confiscation during his exile. His financial skill and his thrifty habits soon restored his own fortunes. He advanced those of his family, and gratified his pride at the same time, by marrying one of his nieces to the prince of Conti, a scion of the younger branch of the royal house of Bourbon, and another to the eldest son of the duke of Modena. Others were already married to great noblemen, and he had refused the hand of yet another, Maria de Mancini, to Charles II. of England, at a time when there seemed to be little prospect of that prince regaining the throne of his ancestors. From his return to Paris till his death Mazarin ruled France with absolute power, the king quietly submitting to his guidance in every affair of state. His last great stroke of policy was his masterly negotiation of the peace of the Pyrénées with Spain in 1659, and the marriage of Louis XIV. with the Spanish infanta, which was celebrated in the following year. "Cardinal Mazarin," says Hénault, "was as gentle as Cardinal Richelieu was violent; one of his greatest talents consisted in knowing men thoroughly. The character of his policy was rather finesse and prudence than force. There was in Cardinal Richelieu something greater, vaster, and less composed; in Cardinal Mazarin more address, more management, and fewer extravagances. People hated the one and derided the other; but both were masters of the state." Mazarin had accumulated during his administration a sum of 40,000,000

livres, equivalent to 200,000,000 francs at the present day. On his deathbed his conscience troubled him about his property, and he gave it to the king, who after keeping it 8 days restored it, and it became the inheritance of the cardinal's relations.

MAZATLAN, a seaport town in the state of Sinaloa, Mexico, and the most considerable on the Mexican coast; pop. about 12,000. It has a very picturesque appearance, whether approached from the sea or by land. On the N. side of the bay or roadstead is a long neck of rocky and fantastic hills, their sides exhibiting projecting crags and deep indentations. Beneath these hills, on the verge of the sea, the houses are thickly crowded together; but the best portion of the town lies on more level ground, and directly facing the roadstead. On the S. are rocky islands, protecting the harbor in that direction. But there is no protection from the W. and S. W.; here the harbor is exposed to the broad Pacific; and when the wind is from that quarter, the sea rolls in with great force. The town is handsomely laid out, and its streets, though narrow, are lined with large and well built houses. Much taste and sometimes luxury are displayed in many of the public buildings and dwelling houses. The style of the buildings is that of the old Castilian, with short columns, Moorish capitals, and ornaments. Some of them present long lines of colonnades. The shops are numerous and well filled. Mazatlan is the port for the neighboring districts, and carries on an extensive commerce with England, France, and the United States. Formerly it received many goods from India. The steamers running between Panama and San Francisco usually stop here in passing. In 1856, 81 foreign vessels arrived there, tonnage 7,168.

MAZEPPA, JAN, hetman of the Cossacks, born about 1685, died in Bender, Turkey, in 1709. He was the son of a Polish gentleman in Podolia, and at an early age became page at the court of John Casimir, king of Poland. On returning to his native province he formed an improper intimacy with a married lady, whose husband caused him, according to the common story, to be tied to a wild horse, which was then let loose on the plains and ran till he reached the country of the Cossacks, where Mazeppa was unbound, and kindly treated by the inhabitants. Another account says that Mazeppa was fastened to his own horse, which brought him back to his own door, and that, unable to endure the disgrace of his position, he left his country and took up his residence among the Cossacks. However he may have arrived among them, his abilities soon gave him great influence, and on the death, in 1697, of the hetman Samoilovitch, whose secretary and adjutant he had been, he was chosen to the chief command. He attained to high favor with Peter the Great; but when the Russians began to encroach on the liberties of his adopted country, he entered into secret connection with Stanislas Leszczynski of Poland, and subsequently into a

league with Charles XII. of Sweden. These plans failed, Mazeppa being besieged by the czar in his capital, whence he at last escaped with an inconsiderable force. The result of the battle of Pultowa (1709) put it out of the power of Charles to aid him, and both fled to Turkey. Mazeppa is the hero of one of Lord Byron's poems, and of several of Horace Vernet's pictures.

MAZZINI, GIUSEPPE, an Italian political leader, born in Genoa in 1809. He is an only son, and grew up in company with two younger sisters and a mother, who encouraged his patriotic aspirations, which however met with no sympathy from his father, a wealthy physician. He received an excellent education at home, learned the German, French, and English languages, devoted considerable attention to literary studies, and excelled in playing the guitar. With a view of becoming a lawyer, he studied jurisprudence at the university of Genoa, where his earliest friend and constant associate, Jacopo Rufini, studied medicine. The two young men set forth their political views in poetical effusions and literary essays in a Florentine publication (*Antologia*), from 1820 till about 1830 the great repository of the thoughts of the most accomplished and enthusiastic youths of Italy. The French revolution of 1830 was hailed with delight by the young patriots, and led them to instigate political conspiracies, which were detected, and Mazzini was imprisoned in the citadel of Savona. His mother could only communicate with him by putting slips of paper in his bread, and informed him in this manner of the rising of the Poles, an event which tended to inflame his revolutionary ardor. After 6 months' detention he was set free, but only to be expelled from the country. He betook himself to Marseilles, at that time the head-quarters of Italian exiles, who mainly at his suggestion organized a league called *la Giovine Italia*, or Young Italy, the object of which was to republicanize the peninsula. This project was furthered by a journal of the same name, edited by Mazzini. Most of the members, including Mazzini, were at that time carbonari, but afterward dissolved their connection with that body, the centralizing tendencies of which they opposed. The motto of "Young Italy" was: "Now and ever;" the emblem of the league was a branch of cypress. Inscribed upon one side of the national flag were the words: "Liberty, equality, and humanity;" and upon the other, "Union, independence, God, and humanity." The bond of union consisted in an oath of allegiance to a common political creed. Faithless members were arraigned by the league, and in case of treason even sentenced to death. Secret sessions were held, and a central committee appointed to wield the executive authority. The members further pledged themselves to resort to active measures for the purpose of liberating their country and for the promotion of the interests of humanity. Mazzini was the leading spirit of this movement. His influence

was enhanced by a commanding presence, expressive both of manly beauty and moral elevation, by the eloquence of his fiery appeals, and by literary capacities of a high order. Even one of his opponents, Mariotti, admitted that there was something in his dark luminous eyes, and in his majestic brow, which commanded obedience. Among the most active emissaries of Young Italy were sailors, who scattered Mazzini's inflammatory publications all over the peninsula. The movement soon attracted the attention of the authorities. A private correspondence in cipher was intercepted, and disclosed the purpose of raising guerilla bands, and other formidable preparations of a revolutionary character. Extracts of this correspondence were published in the latter part of 1832 in the Roman journal *Notizie del giorno*, and traced to Mazzini and his fellow conspirators. A circular inviting the coöperation of republican leaders in foreign countries was addressed, in Feb. 1833, to a journalist of Paris, and was signed Strozzi, the *nom de guerre* of Mazzini, each member of the Young Italy association assuming a feigned name. On Oct. 20, 1832, one of the Italian refugees (Emiliani) at Rhodéz, in southern France, was murderously attacked by 6 of his compatriots, who were said to have acted under the instructions of Young Italy, but which was denied by Mazzini in a letter addressed (Nov. 13) to the *Éclaircur de la Méditerranée*. In Jan. 1833, however, the *procureur général* at Rhodéz was said to have received positive information of a sentence of death signed by Mazzini and passed by the central committee of Young Italy upon Emiliani and Sturiatti, and of a sentence of flogging upon Lazzoreschi and Andriani (all of whom were members of the league), the two former having been found guilty of circulating publications "hostile to the holy alliance of the Italian patriots," and of being on friendly terms with the holy see. According to the same authority, 4 persons were appointed by the committee to carry out the sentence; and failing to do so, they would have forfeited their own lives. Although the assailants of Emiliani in 1832 had been sentenced to 5 years' imprisonment by the French authorities at Rhodéz, those intrusted with the execution of the alleged sentence were not to be deterred; and one of them, Garioli, on meeting Emiliani and Lazzoreschi (on May 31, 1833) in a coffee house of that town, fatally stabbed the latter with his stiletto. Stabbing Emiliani's wife, who had endeavored to save her husband, he next inflicted mortal wounds upon Emiliani, from which he died soon afterward. In the legal proceedings, however, which were instituted against Mazzini by the French government, he could not be convicted as a party to the assassination; but in addition to the suspicion which rested on him in this matter, his name was associated with political and military conspiracies which were discovered in Piedmont in 1833, and with their ramifications in Naples and other parts of Italy. After continuing for some time to issue his jour-

nal from a hiding place in Marseilles, he was at length compelled to leave the French territory and to seek refuge in Switzerland, where, in connection with Polish, German, and other Italian refugees, he planned the adventurous Savoy expedition. The central committee of the "Young Italy" league at Geneva, with Mazzini as its head, and the Polish general Roman Soltyk, constituted a council of war; and among its most conspicuous members were also the retired French general Damas and the Spanish general Mendez Vigo. In Nov. 1833, propositions were made to Gen. Ramorino (who had fought in the Polish revolutionary war) to command the expedition; and according to Mazzini, who furnished a large proportion of the funds for this enterprise, that adventurer received nearly \$8,000 for his services. The plan of the revolutionists, who were assembled partly at Courge, and partly on the northern shore of the lake of Geneva, was to seize the fortress of St. Julien, in Savoy, and the small town of Annecy which commanded the road to Chambéry. Another wing of the revolutionists was to advance from Les Echelles, Ramorino's whole force (which consisted, however, of hardly 1,000 fighting men, chiefly Poles, Italians, and Germans) to unite at Chambéry, the capital of Savoy, and to organize from that place military operations against Piedmont. The attack was actually made on Feb. 1, 1834, at the frontier of Savoy, upon a handful of custom house officers; the custom house was destroyed, and the insurgents advanced to the village of Annemasse, where a proclamation signed by Mazzini, Melegari, and Jacopo Rufini, announced the formation of a provisional government at St. Julien; but it had no effect upon the people, except to afford to some shrewd traders opportunities of smuggling during the confusion in the custom house department. Ramorino, lingering on the road to St. Julien, without attempting to seize that fortress, left the battle field on the evening of Feb. 1, as soon as he heard of the advance of the royal troops; while the insurgents, who had succeeded (Feb. 3) in crossing the bridge near Les Echelles, were completely routed by the soldiers of the garrison at Pont de Beauvoisen. Ramorino was accused of treachery; but after his arrival in Paris he endeavored to vindicate his conduct and to throw the blame of the failure upon Mazzini and his friends. Sentence of death *in contumaciam* was passed by the Sardinian courts upon Mazzini, who however remained unmolested in Switzerland, residing partly in the cantons of Vaud and Geneva, but chiefly at the watering place of Bachtelen, near Grenchen, in the canton of Soleure. Many of those implicated in the Savoy expedition were expelled from Switzerland, particularly the Polish refugees. But before their actual departure from the country, Mazzini had succeeded in obtaining the coöperation of the principal representatives of the various nationalities in the organization of a new association, to be called Young Europe. "Young Italy," "Young Po-

land," &c., appointed delegates, who on April 15, 1834, solemnly agreed to abide by the political, social, and religious platform which was laid down by Mazzini, and the terms of which were published in the languages of the different nationalities. The new league summoned the nations of Europe to rise against their despotic rulers. Mazzini's general instructions for its members imposed faith in God as the sole and supreme ruler of the universe, in his immortal laws as the expression of the divine will, and in humanity as the sole interpreter of those laws. The main object of Young Europe was, according to Mazzini, to lay the foundation for a universal development of thought and action, which would lead to the discovery and practical application of the divine laws of human government. Mazzini defined the league as the young Europe of the people, which was to supplant the old Europe of kings; as a conflict between the modern principles of freedom and the mediæval system of servitude, between the modern sentiments of equality and the old spirit of caste, monopoly, and privileges; and finally, as a triumph of new religious aspirations and ideas over the tottering fabric of a decaying ecclesiasticism. The social application of Mazzini's principles is fully explained in his work, *Voi et avenir* (Biel, 1835). His ideal of a republic, according to this work, consists in a bond of love and union between mankind, founded upon the principle of association. Freedom was to be one of its elements and one of its most essential conditions, but the association was to be rather religious than political; for "political parties fall and expire," he says, "but religious parties never die, unless they have attained their utmost perfection and accomplished their mission by becoming thoroughly identified with the life of humanity." Dissensions between Mazzini and the "Young Switzerland" (in whose interest a journal of that name had been published at Biel chiefly under his influence) and the "Young Germany" parties led him to withdraw from the central committee of Young Europe, and also of the Young Italy league, without however relaxing his zeal for the furtherance of the ends of both of these associations, of which he continued the principal leader. With the exception of a brief term of arrest in 1835, Mazzini was not interrupted in his agitation in Switzerland until 1837, when, yielding at length to the representation of foreign powers, the Swiss authorities requested him to leave; and provided with a passport from the French embassy, he departed for England via France. London became henceforward his headquarters for revolutionizing Italy and Europe, while a secret asylum near Geneva enabled him to be near the scene of action in the contingency of an insurrection in Piedmont. His numerous partisans and friends continued the secret political agitation in Italy, while Mazzini labored by writing and by public addresses in the meetings of the Poles, Italians, or other oppressed nationalities in London. He wrote

articles for the "People's Journal," the "Monthly Chronicle," Lowe's "Edinburgh Journal," the "Foreign Quarterly Review," and the "Westminster Review." Among them are papers on Byron and Goethe, George Sand, Victor Hugo and Lamartine, Thiers and Carlyle, on Fourierism and communism, and on Italian and German music. Beside publications, in journals and in pamphlets, on the political condition of Italy and other European states, he wrote extensively in behalf of a comprehensive system of popular education. Some of his most striking ideas in that regard are laid down in the Italian journal *Apostolato popolare*, which he published in London from 1840 to 1848. In 1842 he wrote a preface to a new edition of Dante's *Divina Commedia*, and prepared a complete edition of the works of Ugo Foscolo. He founded in London in 1840 a Sunday school for poor Italian children, and officiated in person as one of the teachers.—The tragic fate of the brothers Bandiera called public attention with increased force to Mazzini in 1844, he being considered as the inspiring spirit who had led those patriots to make the daring attempt upon the Austrian fleet which cost them their lives, although Mazzini had in reality opposed that particular movement. At the same time the English minister, Sir James Graham, was detected in having opened and intercepted letters addressed to Mazzini, which led to the discovery and the suppression of the Bandiera conspiracy; and the proceedings which the despotic powers wished the English government to institute against the Italian refugees fell to the ground amid the general cry of indignation at the conduct of Sir James Graham, to whom Mazzini addressed a spirited letter on the occasion, which contributed to increase the popularity of the latter. After having protested in 1846 against the enlistment of Swiss soldiers for the papal army, and against the annihilation of the republic of Cracow, he founded in 1847 an "international league of peoples," the principal object of which was to enlighten the people of England upon foreign politics, and to diffuse principles of self-government among the nations of Europe. At the end of 1847 he proceeded to Paris to confer with other leaders in regard to the growing revolutionary feeling in Italy, but soon returned to London, where the revolution of Feb. 24, 1848, took him like many others completely by surprise. Five days afterward he returned to the French capital, where he had an interview with Gioberti, Mamiani, and other leaders of the constitutional party; but Mazzini was opposed to the annexation of the smaller Italian states to Sardinia, which was eventually proposed by those statesmen. On March 8 he issued an address to the people of Lombardy, congratulating them upon the success of their insurrection, and 11 days afterward (April 10) he set foot on Italian soil after 17 years' of exile. His reception at Milan was a triumph, but his exertions there in behalf of national in-

dependence were neutralized by the vacillating policy of Charles Albert, whom he characterized as the Hamlet of monarchs. After having been foiled in Milan, and endeavored in vain to raise the standard of rebellion in other parts of Italy, Mazzini offered to enlist as a common soldier under Garibaldi, whose vanguard was on the point of advancing in forced marches from Monza to Bergamo, when the capitulation of Milan to the Austrians (Aug. 5) led to the disbandment of the patriots. In a pamphlet published in 1850 in Brussels, *Cenni e documenti intorno all'insurrezione Lombarda e alla guerra regia del 1848*, Mazzini relates the circumstances which proved fatal to his efforts and those of other radical leaders in Milan during the revolution of 1848, and which compelled him to retire to Switzerland. Soon after his arrival there, the news of the rising in Tuscany was received, together with the continued resistance of Venice, which from the beginning had acted in accordance with his republican views under the lead of Manin, and encouraged him to depart for Florence. Here he became a member of the provisional government, and was sent as deputy to the Roman republic, which had been proclaimed in Feb. 1849. He was elected a triumvir by the Romans, and became the ruling spirit of the republic, the hopes of which, however, were blighted by French intervention, Rome surrendering to Marshal Oudinot after a heroic resistance, and the French entering the city, July 8. Mazzini left Rome without a passport in an Italian ship, and proceeded to Marseilles, and from thence to Lausanne, where he was met by Saffi and other friends. Venice surrendered to the Austrians in August, but Mazzini continued at Lausanne the journal entitled *Italia del popolo*, which he had commenced at Milan, and addressed letters to De Tocqueville, De Falloux, and Montalembert, vindicating his administration in Rome, and denouncing them as the destroyers of Roman liberty. He remained for some time in Switzerland, organizing there a new national committee for continuing his agitations. His secret asylum there consisted of a cottage which had been purchased by his friends, only the most intimate of whom were acquainted with its locality. Persons were conducted there in a carriage with their eyes bandaged until they reached the vineyards in the midst of which it is situated. His other hiding places on the continent and in London were equally inaccessible and well protected by his friends. On his return to London he united his efforts with those of Ledru-Rollin, Kossuth, Arnold Ruge, and other revolutionary leaders. His name was associated with the dagger insurrection in Milan (Feb. 6, 1858), started by a number of young enthusiasts who were led on by the inflammatory zeal of Mazzini, but which was promptly suppressed by the Austrian government. Among those most active in cooperating with Mazzini was Orsini; but on returning to London, after an abortive insurrection attempted at Milan in

1854, at the suggestion of Mazzini, he separated himself from him; and in his memoirs, which appeared in Edinburgh in 1857 before his attempt upon the life of Napoleon III., he reproached Mazzini with recklessness and disregard of the lives of his friends, and expressed his distrust in his ability to control the storms roused by his agitation, and which generally proved fatal to those who embarked in these efforts. Mazzini, however, persisted in his propaganda; and notwithstanding the disapprobation of Manin and of other republican leaders, he again instigated an insurrection in Sardinia in 1857, and proceeded to Genoa to superintend it. His followers seized Fort Diamante in the night of June 29; but as the people did not join the movement, Mazzini was compelled to abandon the enterprise. Miss White (now Mme. Mario), an English lady and one of his devoted followers, was arrested on this occasion. His friends who attempted similar outbreaks at Leghorn and Naples fell into the hands of the government, including those captured on board the steamer *Cagliari*, and were put to death or doomed to imprisonment, while Mazzini himself retired to his place of concealment near Geneva, and afterward returned to London, where he endeavored to vindicate his course in a pamphlet entitled "The late Insurrection defended by Joseph Mazzini" (London, 1858). After the suppression of the *Italia del popolo* in Genoa, he established at the end of 1858 a weekly journal in London, entitled *Pensiero ed azione*. During the war of 1859 in Lombardy, he constantly resisted the idea that Italy could be benefited by the intervention of Napoleon III., though he called upon his countrymen to promote the expulsion of the foreign enemy by revolutionary movements in other parts of the country. However, since the consolidation of Upper Italy he has exhibited a less hostile frame of mind toward the Sardinian royal house as the representative of Italian unity. Still it is certain that a manifesto attributed to him, and renouncing republicanism, was a fabrication. Garibaldi's expedition to Sicily in 1860 called him to new activity, the character of which is not yet clearly defined.—Conspicuous among the many qualities for which Mazzini is admired by his friends, are his Spartan-like simplicity and frugality, and his integrity. He has sacrificed his own patrimony for the cause of his country, and although considerable sums of money have passed through his hands, he has always restricted his private expenditures to the barest necessities of life, and submitted himself to the greatest privations.

MAZZOLINI, LOBOWICZ, an Italian painter, born in Ferrara about 1481, died there in 1580. He was a pupil of Lorenzo Costa, and in small pictures, particularly his miniature altarpieces, attained great excellence. His architectural backgrounds are especially admired. His works are not numerous, but are to be found in the chief galleries of Europe. The national gallery in London possesses two excellent holy families by Mazzolini.

MAZZUCCHELLI, GIOVANNI MARIA, count, an Italian jurist, antiquary, and biographer, born in Brescia in 1707, died there in Nov. 1765. He was educated at Bologna, and afterward became keeper of the Quirinian library in his native city, where he devoted himself to Italian antiquities and biographical literature. He wrote *Notizie storiche e critiche intorno alla vita, alle insensazioni ed agli scritti di Archimede Siracusano* (Brescia, 1737); *Gli scrittori d'Italia, cioè notizie storiche e critiche intorno alle vite ed agli scritti dei letterati Italiani* (6 vols. fol., 1758-'68, not complete), and many other works; and left a vast collection of casts and medals, afterward engraved and published.

MAZZUOLA, FRANCESCO. See **PARMEGIANO**.

MEAD, RICHARD, an English physician and author, born at Stepney, near London, in 1675, died in London, Feb. 16, 1754. He studied at Utrecht and Leyden, received the degree of M.D. at Padua in 1795, and returning to England settled at Stepney. In 1708 he was elected a member of the royal society, of which Sir Isaac Newton was then president, and in the same year was chosen physician of St. Thomas's hospital. In 1711 he was appointed anatomical lecturer to surgeons' hall, and in 1714 removed to London. In 1719, when the plague broke out at Marseilles, he was consulted by the government as to the best method of excluding it from England, and in 1727 was nominated physician to George II. The wealth derived from his practice was chiefly devoted to the patronage of science and literature, and to the collection of a valuable library, antiquities, and works of art. His "Medical Works" were published in 1762 (4to., London).

MEADE, a N. co. of Ky., on the Ohio river, drained by Otter and Spring creeks and other tributaries of the Ohio; area, about 400 sq. m.; pop. in 1850, 7,898, of whom 1,578 were slaves. It has an undulating surface and fertile soil. The productions in 1850 were 873,145 bushels of Indian corn, 125,188 of oats, 210,427 lbs. of tobacco, and 13,095 of wool. There were 10 grist mills, 2 saw mills, 2 tanneries, and 9 churches. Capital, Brandenburg.

MEADE, RICHARD KIDDER, an American revolutionary soldier, born in Nansemond co., Va., about 1750, died in Frederic, now Clarke co., in the early part of the present century. He was educated at Harrow school in England, and soon after his return to Virginia embarked in the revolutionary contest. In Dec. 1775, he commanded a company at the battle of the Great Bridge near Norfolk, the first fought in the state, and soon after he was appointed by Washington one of his confidential aids, in which capacity, with the rank of colonel, he rendered signal service throughout the war. He was with the commander-in-chief in all his great battles, and superintended the execution of Major André, a duty which he was accustomed to say he could not perform without tears. The latter part of his life was passed on his estate in Frederic co., where he principally

occupied himself with agricultural pursuits.—**WILLIAM, D.D.**, son of the preceding, an American clergyman, bishop of the Protestant Episcopal church in the state of Virginia, born in Frederic, now Clarke co., Va., Nov. 11, 1789. He was graduated at Princeton college in 1808, and 8 years later was ordained to the ministry of the Protestant Episcopal church by Bishop Madison of Virginia. Entering upon his duties at a time when the Episcopal organization in Virginia had from various circumstances fallen into decay, he attracted attention by the earnestness of his preaching and his efforts to strengthen the numbers and influence of his denomination. The centre of his ministerial labors was from the first the parish church near his patrimonial home; and being independent in his pecuniary circumstances, he for many years officiated gratuitously in his own parish and in the surrounding country. In 1813-'14 he took an active part in procuring the election of Dr. Moore of New York as the successor of Bishop Madison in the episcopate of Virginia, and contributed materially to the establishment of a diocesan theological seminary, and various educational and missionary societies connected with his denomination, now in active operation in Virginia. In 1829 he was unanimously elected assistant bishop of Virginia, and in August of that year was consecrated in Philadelphia to the episcopal office. He thenceforth assumed the chief care of the diocese, and in 1841, upon the death of Bishop Moore, had the sole charge of it. Ill health soon compelled him to ask for an assistant, who was provided in 1842 in the person of Dr. Johns of Baltimore. Bishop Meade has, however, steadily performed his episcopal duties down to the present time, visiting his large diocese biennially, beside delivering annually a course of lectures at the Episcopal theological seminary, and publishing occasional tracts and treatises on doctrinal questions, local church history, &c. His doctrinal views are of that class known as evangelical, and he has been for a number of years the acknowledged head of the evangelical branch of the Protestant Episcopal church in the United States. His publications comprise "Family Prayer" (Alexandria, 1834); "Lectures on the Pastoral Office;" "Lectures to Students" (New York, 1849); and "Old Churches, Ministers, and Families in Virginia" (2 vols. 8vo., Philadelphia, 1856).

MEADOW LARK, a starling, of the American genus *sturnella* (Vieillot). The body is thick and stout, the legs large, with hind toes reaching beyond the tail, which is short, even, and of narrow pointed feathers; the bill is nearly straight, and 3 times as long as high; inner lateral toe longer than the outer; hind claw nearly twice as long as the middle; feathers of head stiffened, the shafts above extended into a black bristle. The common species (*S. ludoviciana*, Swains.) is about 11 inches long, with an extent of wing of 16, and the bill 1½ inches; the color above is dark brown, each feather with a brownish white margin and a

pale reddish brown terminal spot; wings and tail with dark brown bars; yellow beneath, with a black pectoral crescent; sides, rump, and tibiae pale reddish brown, with blackish streaks; a light median and superciliary stripe, yellow in front of the eye, and a black line behind. It is found in the eastern United States to the high central plains, extending perhaps as far south as Mexico. It is abundant in the southern states in the winter, whence it proceeds northward as far as Maine to breed, returning in the autumn in small flocks; the flight is generally short, unsteady, and at a moderate elevation; the notes at early morning are loud and melodious. The males are very pugnacious in breeding time; the nest is made of grasses in a hollow of the ground, and is covered over like an oven; both sexes incubate; the eggs, 4 or 5, are white, with reddish brown spots at the larger end; the young are hatched about the end of June in the middle states. The meadow lark is the friend of the farmer in its destruction of injurious larvae, but it sometimes pulls up the young corn, grain, and rice; it occasionally kills small birds, especially in confinement. In autumn and winter meadow larks are fat, and are sought by the sportsman; the flesh of the young is esteemed as food. On the Pacific coast there is found the western meadow lark (*S. neglecta*, Aud.), nearly resembling the other, but rather paler in tint, with the yellow on the chin and throat extending on the sides of the lower jaw. This bird is related to the starlings of Europe, of the genus *sturnus* (Linn.).

MEADOW MOUSE, the common name of the small rodents of the genus *arvicola* (Lacép.). The molars are $\frac{3}{3}$, and rootless; the ears are short, nearly hidden in fur; the muzzle is broad and rounded; the tail shorter than the body, cylindrical and hairy, soles naked anteriorly; the skull short, deep, and broad; whiskers in 5 horizontal series. The common meadow mouse (*A. riparia*, Ord) of this country is $4\frac{1}{2}$ inches long, and the tail about $1\frac{1}{2}$; the feet large and scaly; hair rather short; the eyes small, the thumb of the fore foot obsolete, and mammae 4 inguinal and 4 pectoral; the color above is dark brown, varied with reddish and yellowish brown; ashy plumbeous below; tail and feet dusky. Many other species are described in vol. viii. of the report on the "Pacific Railroad Survey." The European species are called also *campagnols* and *voles*; the largest is the *hypudomys amphibius* (Ill.), which is aquatic in its habits, inhabiting the banks of streams and digging in the marshes for roots. The *campagnol* (*H. arvalis*, Ill.), of the size of a mouse, is yellowish gray above, and whitish gray below; it lives in holes dug in the ground, in which it collects food for the winter. The economic meadow mouse (*H. oeconomus*, Ill.) lives in Siberia, laying up ample winter stores, and sometimes migrating in large troops like the lemmings.—The meadow mice are spread over the northern hemisphere of America, Europe, and Asia, as yet not having been found in South America

and Africa; they are abundant in the mossy swamps in the vicinity of the arctic circle. Some are aquatic, having the antitragus of the ear so developed as to act as a valve under water; others live in dry places and high lands, where they do much mischief by gnawing the bark of trees and destroying grain and fruit; they do not climb, and are not dormant in winter, but retreat at that time to their well-stored burrows. They are very prolific, and, from the great number of individuals, are the source often of considerable loss to the farmer; in 1818 and 1819 most of the harvest of Holland, and in 1837 of that of an entire province of Italy, was destroyed by them; in a German province in 1822, 1,500,000 were captured in 14 days. These animals in their turn furnish a supply of food to carnivorous mammals, birds, and reptiles. For an account of their habits, see Audubon and Bachman's "Quadrupeds of North America."

MEADOW SAFFRON. See *Colochicum*.

MEADVILLE, the capital of Crawford co., Penn., on the left bank of French creek; pop. in 1850, 2,578. It is in the midst of a very fertile country, for which it is the principal market. It is the seat of Alleghany college, founded in 1817, and since 1833 under the direction of the Methodist Episcopal church. This institution has a president and 6 professors, with 104 students and 299 alumni in 1859, and a library of 9,600 volumes, and occupies a fine edifice on an elevation near the town. It is also the seat of the western theological seminary under the direction of the Unitarians. In 1850 there were 8 churches (Baptist, Cumberland Presbyterian, Episcopal, Lutheran, Methodist, Presbyterian, Roman Catholic, and Unitarian), a handsome court house, and a state arsenal.

MEAL WORM, the name given in Europe to the larva of a black heteromorous beetle, the *tenebrio molitor* (Linn.). The perfect insect, about $\frac{3}{4}$ of an inch long, appears in the evening in the least frequented parts of dwellings, in flour mills, bake houses, and pantries. The larva is more than an inch long, cylindrical, scaly, and of an ochrey yellow color; it is destructive to flour and meal, and to articles made from them; it is said to remain 2 years in this condition, and occasionally to have been eaten and rejected from the human stomach; it forms a favorite food for the domesticated nightingale.—The name of meal worm is given in New England to the larva of a small delta moth (*pyralis farinalis*, Linn.). The moth is often seen on the ceiling of rooms, resting with its tail curved over the back; the fore wings are long and narrow, and cover the hind ones when at rest; they are light brown, crossed by 2 curved white lines, and have a dark chocolate spot at the base and tip of each. The larvae are long and slender, tapering at each end, naked, and with numerous legs; they are often seen in flour barrels, meal chests, and similar places. Some of the larvae of the moths of the genus *tinea* make a thick whitish gray web over corn and meal.

MEALY BUG, a very destructive insect in

greenhouses, of the order *hemiptera*, and family *coccidae* or bark lice, the *O. Adonidum* (Linn.). The perfect insects resemble small scales; the reddish larvæ are small, but very active, flat and oval in shape; the females have a beak with which they pump up the juices of plants; they fix themselves from time to time for the purpose of changing their skin, when they cover themselves with a white, powdery, cottony substance, which has given them their common name. Several broods are produced in a year, which cause great annoyance in hot-houses; the eggs are deposited in a similar cottony material. In the natural state many are destroyed by ichneumon parasites and are devoured by birds. Alkaline washes have been found most effectual in checking their ravages, both within and out of the greenhouse.

MEANS, ALEXANDER, M.D., D.D., an American clergyman, born in North Carolina, Feb. 6, 1801. He taught school for a time in Mocksville, N. C., and soon afterward removed to Georgia. He determined to become a physician, but was able to attend only one course of medical lectures at Transylvania university, Ky. In 1840-'41 the medical college at Augusta, Ga., conferred upon him the degree of M.D. He became a local minister in the Methodist Episcopal church in 1828, and has gained a high position in the southern pulpit. In 1834 he was requested by the church to become superintendent of the manual labor school, near Covington, Ga. On the organization of Emory college in 1838 he was called to the chair of natural science, which post he occupied for 18 years, lecturing also on chemistry during part of the year at the medical college of Augusta, Ga., from 1841 to 1858. In 1858 he presided over the masonic female college in Covington, and in the following year was chosen to the presidency of Emory college, which he resigned in 1855. He then accepted the chair of chemistry in the medical college at Atlanta, lecturing there during the summer and at Augusta in winter; since 1858 he has devoted all his time to the former institution. He visited Europe in 1851, and was elected in the same year a member of the American association for the advancement of science. He received from Emory college in 1854 the degree of D.D., and in 1858 that of LL.D., and the title of emeritus professor.

MEARNS, THE. See KINGARDINSHIRE.

MEASLES (*rubeola*, *morbilla*), a contagious exanthematous fever, attended with a characteristic eruption. Up to the latter part of the last century measles and scarlet fever were confounded together, or at least were esteemed, like simple and confluent small pox, to be mere varieties of a common disease. Measles commences with the ordinary symptoms of fever, chilliness, loss of appetite, and lassitude, succeeded by heat of skin, thirst, and frequency of pulse; but in addition to these, the attack is almost invariably attended with inflammation of the mucous membrane lining the air passages; the eyes are red and watery; there is deflux-

ion from the nostrils, hoarseness, and cough. The eruption commonly appears on the 4th day, at first about the head and neck, then the trunk and arms, and finally reaching the lower extremities; it takes 2 or 3 days to complete its course, and when it reaches the feet and legs has often begun to disappear from the face. The eruption consists of little papules, somewhat resembling flea bites, of a dark red color, and which as they coalesce at their edges assume an irregularly crescentic form. The period of incubation, that is, the time elapsing from exposure to the contagion to the time of attack, is put down as from 7 to 14 days. All ages are liable to it, though infants at the breast are not so apt to be attacked as those somewhat older. A few years ago it made its first appearance at the Farøe islands, and spread like a pestilence from house to house and from village to village, sparing neither infancy nor old age in its progress. The disease is not commonly a dangerous one, though when introduced into the Society islands, some years since, it proved exceedingly fatal. When the eruption is fully out, the cough, at first dry and troublesome, generally becomes softer and less frequent; and at the end of 6 or 7 days from the coming out of the first papules they have again disappeared. Where danger occurs, it is from inflammation of the air passages; the disease may thus become complicated with croup, or in subjects predisposed to consumption the seeds of that disease may be developed. The eyes, too, are sometimes left irritable and inflamed. In all ordinary cases, a simple diet, the maintenance of an equable temperature, and perhaps the exhibition of a mild diaphoretic or expectorant, are all that is required.—For an account of measles in swine, see ENTOMOZOA.

MEASURES. See WEIGHTS AND MEASURES.

MEATH, an E. maritime county of Ireland, in the province of Leinster, bounded N. by Cavan, Monaghan, and Louth, E. by the Irish sea and Dublin, S. by Kildare and King's co., and W. by Westmeath; area, 906 sq. m.; pop. in 1851, 140,750. It has only about 10 m. of coast, and no harbor of importance. The surface is generally level, the soil fertile, and the climate healthful. The chief rivers are the Boyne and Blackwater. Coarse linens, cottons, frieze, paper, &c., are manufactured. Meath returns 2 members to parliament. The chief towns are Navan, Kells, and Trim. The midland great western railway, and the Dublin and Belfast junction railway pass through the county.

MEAUX, a town of France, in the department of Seine-et-Marne, 28 m. by railway E. N. E. from Paris; pop. in 1856, 8,097. It is situated on the Marne, near the canal of Ourq. Meaux is an episcopal town, and was the see of Bossuet, the "eagle of Meaux," as he has been called, whose remains repose in the cathedral, and relics of whom are preserved in the episcopal palace.

MECCA, the chief of the three holy cities of the Mohammedans, capital of the province of El Hejaz, Arabia, 70 m. E. from Jiddah, its port

on the Red sea, and 250 m. S. from Medina, in lat. $21^{\circ} 80'$ N. and long. $40^{\circ} 8'$ E.; pop. about 45,000. It lies in a narrow valley shut in by high bare hills. Its length from N. to S. is about $2\frac{1}{2}$ m., and its breadth is somewhat less than a mile. It is not surrounded by walls, but is defended by a fortress situated on an elevation S. of the city. The houses are well built of brick and stone, and, unlike those of most oriental towns, have windows opening to the street; they generally contain apartments intended to be let as lodgings to the pilgrims who annually visit the holy city. The streets are broad and unpaved. The only public building worthy of note is the shrine or temple called *Bait Ullah*, "House of Allah," or more commonly *Caaba*, "Square House." This great sanctuary, the most famous and holy in the Mohammedan world, stands in the centre of an oblong square, enclosed by a wall 250 paces long and 200 broad, none of the sides of which run in a straight line, though at first sight the whole appears to be of regular shape. Inside of the wall is a colonnade consisting of a quadruple row of pillars on the eastern side and of a triple row on the other sides. These pillars are upward of 20 feet in height, and generally about 18 inches in diameter. Some are of white marble, granite, or porphyry, but the greater number are of common stone from the neighboring hills. The number of these pillars is variously stated by authors. Burton, the latest authority, counted 554. They are united by pointed arches, every 4 of which support a small dome plastered and whitened on the outside; these domes are 152 in number. Parts of the walls and arches are gaudily painted in stripes of yellow, red, and blue. The floors of the colonnades are paved with large stones badly cemented together. The *Caaba* is 115 paces from the northern colonnade and 88 from the southern. It is an oblong, massive structure, 18 paces in length, 14 in breadth, and from 35 to 40 feet in height, and is built of fine gray granite in horizontal courses of masonry of irregular depth; the stones are well fitted together, and held by excellent mortar like Roman cement. It was entirely rebuilt as it now stands in 1627, a torrent in the preceding year having thrown down 8 of its sides. The roof of the *Caaba* being flat, it has at a distance the appearance of a perfect cube. At the S. E. corner of the *Caaba* is the famous "black stone," which is believed to have been brought from heaven by angels. It forms a part of the angle of the building, 4 feet 9 inches from the ground, and is an irregular oval about 7 inches in diameter, with an undulating surface, composed of about a dozen smaller stones of different sizes and shapes well joined together with a small quantity of cement, and perfectly well smoothed. It looks as if the whole had been broken into many pieces by a violent blow and then united again. The color is black and metallic. Burckhardt thought it looked like a lava containing several small extraneous particles of a whitish and of a yellowish substance;

while Burton says it appeared to him a common *aërolite*. It is surrounded by a border of reddish brown cement, which is encircled by a gold or gilt ring. The pilgrims who walk around the *Caaba* begin their procession at the black stone, which is touched and kissed with the highest veneration. A pavement of granite, polished like glass by the feet of the faithful in their circumambulations, surrounds the *Caaba*. Outside of this pavement, which forms an irregular oval, is a line of iron posts supporting cross rods from which hang white or green glass globe lamps. The interior of the *Caaba* is plain, and there are no windows or any other opening except the entrance and a small door leading to a staircase to the roof. The floor and walls are covered with marble of various colors, but mostly white; and the roof and upper part of the walls are covered with red damask embroidered with gold. The interior is lighted by many lamps, but there is no other furniture except a small press in one corner in which the key of the building is sometimes placed. Near the door, outside, is a small hollow, where Abraham and Ishmael are said to have mixed the cement for building the *Caaba*. On the N. W. side are the supposed graves of Ishmael and Hagar enclosed by a semicircular wall covered with white marble. Opposite the E. corner of the *Caaba* is the *sem sem* or sacred wall, believed to be that of Hagar. Its water is unpleasant in taste, and has a cathartic effect; the Mohammedans ascribe to it great and peculiar virtues. None but Mohammedans are admitted to the *Caaba* or its enclosure, but a few travellers from Christendom have ventured to enter in disguise at the risk of their lives. The most noted of these were Burckhardt and Burton. Mt. Arafat, 12 m. E. from Mecca, is visited by all pilgrims, who must perform there certain devotions and listen to an annual sermon before they can justly claim to have performed the pilgrimage. It is about 200 feet in height, and rises from a gravelly plain on which the pilgrims pitch their tents.—The trade of Mecca is chiefly derived from the pilgrims, who come from all parts of the Mohammedan world, and generally bring merchandise with them. The people are lively and polished in their manners, and have a remarkable knowledge of various languages, owing to their constant intercourse with people from remote countries. There are few artisans, and some small potteries and dye works are the only manufactures. The climate of Mecca is sultry and unwholesome, especially in August, September, and October. Little is known of the history of the place, which is undoubtedly of very great antiquity. It was the birthplace of Mohammed, and has ever since his time been regarded with peculiar reverence by his followers. It is ruled by a sheriff, who at present is nominally dependent on the Turkish sultan. The Wahabees took possession of Mecca in 1803 and held it till 1818, when they were expelled by Mehemet Ali, pasha of Egypt.

MÉCHAIN, PIERRE FRANÇOIS ANDRÉ, a French mathematician and astronomer, born in Laon, Aug. 16, 1744, died in Castellon, Spain, Sept. 26, 1805. After receiving such education as the limited means of his father enabled him to give him, he became a mathematical tutor, devoting his leisure hours to the study of astronomy. Trying to sell his telescope in order to assist his father, he attracted the notice of the astronomer Lalande, who procured him a situation as hydrographer under the government. In this capacity he assisted M. Bretonnière in surveying the French coast between Nieuport and St. Malo; but it was chiefly to the theory of eclipses and comets that his attention was directed, 11 of the latter having been discovered and the orbits of 24 computed by him. In 1782 the academy of sciences admitted him to membership and awarded a prize to his "Memoir on Comets." In 1791 he was employed by the national convention, together with Delambre, to measure the arc of the meridian comprised between Dunkirk and Barcelona, and, on returning to Paris, refused to deliver his papers to the academy, because he had detected a difference of 3" in his calculations respecting the latitude of Barcelona. This discrepancy so troubled his mind that, even after being appointed director of the observatory of Paris, he solicited the board of longitude to permit him to prolong the measurement of the arc from Barcelona to the Balearic islands, that he might have an opportunity of correcting his error. The board consented, and Méchain set out for Spain to conduct the operation, but fell a victim to an epidemic disorder on the way. The most important of his scientific papers are to be found in the *Mémoires des savants étrangers*; in the *Transactions* of the French academy; and in the *Connaissance des temps* subsequent to 1785, of which ephemeris he was for some time editor.

MECHANICS (Gr. μηχανική, μηχανεύω, to contrive, invent, or construct), the science in which are developed the laws of the phenomena attending or produced by means of the action of machines, or resulting from agencies such as are or could be employed in propelling machinery, and that are hence termed mechanical. In itself, this science is complete and distinct, and its usual association with certain branches of physics, under the common title of natural philosophy, is due to no necessary connection, but at the most to an incidental relationship. As in so many similar instances, the actual devising and use of mechanical combinations for needful purposes, long preceded the discovery of the general principles underlying their efficiency. Machines impelled by human or brute power, by weights, springs, water, or moving air, were invented during very early periods. Otesibius, probably about 250 B. C., is said to have discovered and applied the elastic power of air, and to have invented certain hydraulic machines. To these his pupil, the elder Heron, added still others, including

the common pump; and among other works of this writer, his "Mechanics" and *Barutecae* (lifting of weights) especially, though, with all the mechanical writings of early times, wanting in true conception and explanation of principles, show already a very considerable progress in the descriptive knowledge and classification of machines. Heron treats of five of the so called "mechanical powers," omitting only the inclined plane; and he attempts to resolve all these into cases of the lever. Archimedes appears to have been the first to demonstrate correctly the law of the lever, and the important principle of centre of gravity. But not until the labors of Galileo and his successors, dating from the discovery of the first law of motion (1688), did mechanics begin to assume in any degree the character of a science. As now developed and extended, the subject of machinery proper is but one of its branches, though a very comprehensive one, and of growing importance.—The objects considered in mechanics are bodies, single or variously united in construction; and mechanical forces, or those which act upon bodies from without, and move or tend to move them visibly and in the mass. A body is any separately existing mass of matter. A force is any cause of motion or change, or that is capable of preventing such motion or change. Mechanical forces must be distinguished, in their nature, from those that are physical or chemical; though among the effects produced by these latter some are mechanical. Now, one or many of the forces considered in mechanics acting upon any body, and not counteracted, produce or tend to produce motion. Counteracted by equal and opposite force or forces, no motion results; the forces are then said to be in equilibrium, or the body to be in equilibrium between them; and the body is kept in a state of rest. When motion occurs, it is over certain spaces in certain times; and the relation of the space to the time fixes the speed or velocity. Again, by the motions they produce, or can produce, forces are compared and measured; and by the motions they can destroy, resistances are measured. All these, and also volumes or masses of bodies, are magnitudes consisting of a single factor, i. e., of one dimension, and so can be represented by lines. But the weight of a body is a product of two factors, a certain unit of gravitative force into a certain mass, and a pressure or momentum is a like case; these are magnitudes of two dimensions, and representable by areas. Now the elements of every mechanical question or problem are these and like magnitudes, as, 1, number; 2, space and direction, giving rise to lines, areas, solidities, and angles; and 3, time, mass, force, velocity, pressure, weight, momentum, resistances, &c. All these are quantities that can be expressed and reasoned about geometrically, and of course also arithmetically and algebraically. When, therefore, observation has collected the phenomena accurately, a pure mechanics—simply a branch of the pure mathematics—is developed, and on

one or more bases. Taken in its widest sense, mechanics deals with phenomena of all bodies, so far as these are not distinctively the results of a solid, a liquid, or an æriform state. The modifying effect of these states regarded, we have a threefold division, into solid or geo-mechanics, liquid or hydro-mechanics, and ærial or æro-mechanics. Of these, the first usually receives the name proper to the general subject. In another view, as treating of motion or equilibrium, the subject, or any one of its three divisions, has two branches: dynamics, which considers the laws of phenomena of motion; and statics, those of phenomena of equilibrium. The practice of discussing statical phenomena first in order has arisen from a misconception of the case; in reality, these are always more complex than the dynamical, since they include the counteracting as well as the acting forces. Thus, statics is a peculiar case under and offshoot of dynamics; but the science has not yet been so far recast in this method, as to warrant its presentation as a popular account of the subject. Very recently, the labors of Monge, Ampère, Willis, and Rankine have further differentiated the subject matter of the science, in a way promising to be of advantage in mechanical studies. To speak here of nothing further, it is well known that dynamics embraces the modifications and results of both motions and forces; these writers have removed out of the total subject the consideration of the modifications of pure motion—a department to which they have given the name *cinematics* (Gr. *κίνημα*, motion). Mr. W. J. M. Rankine, the last named of the above writers, recognizes as composing the theory of machines the following topics: 1, pure cinematics, which is the consideration purely of space and motion; 2, applied cinematics, or the simple theory of mechanism, dealing with such questions as the motions of a point, of a fluid surface, of a rigid solid, of a pair or elementary combination of pieces, of trains of pieces, and of aggregate combinations; 3, applied dynamics, considering the laws of motion and of deflecting forces, the nature and measure of work, the conditions of loss to which the application of various motors is subject, and the uses of the dynamometer; 4, purposes of machines, as for observation or for work, and special applications in each sort; 5, applied energetics, or the theory of prime movers and sources of power. For the best recent authorities, not only in respect to the general exposition of mechanics, but also as developing the subject in the new directions here briefly indicated, the reader is referred to Poncelet, *Mécanique industrielle*; Morin, *Leçons de mécanique pratique* (translated into English, 8vo., New York, 1860); Moseley, "Elements of Engineering and Architecture," and Rankine, "Applied Mechanics" and "Steam Engine" (London, 1859). Dealing with motions of bodies at large, mechanics investigates the movements of the celestial bodies, as well as of the terrestrial. Thus its principles run through

astronomy; and they wholly constitute that branch of the science known as physical astronomy. Again, mechanical properties and laws enter into and modify physical, chemical, and even vital phenomena. The present summary will be devoted to the principles of general and of solid mechanics. For the special subjects of liquids and æriform bodies, see *HYDRO-MECHANICS*, and *PNEUMATICS*.—The study of properties of material objects finds its place in somatology; it will be proper here to enumerate those relating to mechanical questions. These are of two classes, the general and the peculiar. Among the general, magnitude, figure, and impenetrability are necessary properties, being essential to the very idea of body; indestructibility, molecularity (constitution of molecules), porosity (physical), inertia, and mobility, inferential properties, or such as we infer from the observed behavior of bodies; while, from one or another of these latter, flow certain derived properties, as divisibility, density (in the general sense), compressibility, expansibility, &c. General properties have, of course, no opposites. In nature, and usually in our nomenclature, each peculiar property has its opposite; so that here we find porosity (sensible) and imperviousness, density (in the particular sense) and rarity, hardness and softness, flexibility and rigidity, elasticity and inelasticity, ductility and brittleness (to extension), malleability and brittleness (to lamination), tenacity and fragility. The quantity of matter a body contains is termed its mass. And because the weight of a body varies with the force of gravity, though its mass be unchanged, if we call a mass M , its weight W , and the force of gravity g , then, for any body, $M = \frac{W}{g}$;

and hence, $W = Mg$. The density (in the general sense) of any body is the mass of a unit of its volume; or again, $M = dv$. In respect to elasticity, a body distorted with a certain force e , restores itself with an equal, with less force, or not at all. Calling the force of restitution r , and the ratio of this to the disturbing force e , we have, universally, $e = \frac{r}{e}$, as the expression for the fraction of the disturbing force to which in any case the elasticity is equal; e is hence the *modulus* of elasticity. In the mechanical point of view, impenetrability, inertia, mobility, elasticity, and mass are the elements in body which are of highest importance. Preëminently so is inertia, that property in virtue of which all bodies are in themselves passive, and hence incapable of changing their state, whether from motion to rest or the contrary. Indeed, the so called "three laws" of motion are but so many consequences flowing directly from this property; so that out of it, by means of the relations it establishes of mass to force, the whole of dynamics may be said to arise.—Rest, in any body, may be: 1, absolute, *i. e.*, actual; 2, apparent, as when a real motion of the body is not perceived; 3, relative, as when the body, really in motion, preserves its place with reference to

other moving bodies. So, in itself considered, motion is: 1, absolute, or actual; 2, apparent, when, whether the body really move or not, it is by any means made to appear to move with some velocity or direction which it has not at the time; 3, relative, as when, and by the amount to which, the speed of one of two moving bodies exceeds or falls short of that of the other. Again, in reference to its character, motion is: 1, translation, when the body as a whole passes through a succession of places in space; 2, rotation, when the parts of a coherent body are made to turn about some fixed line or axis passing through its form; 3, translation and rotation combined; 4, irregular, in character. And, in reference to directions, a motion of translation is: 1, rectilinear, or straight-lined; 2, curvilinear, or along some curve, of which kind circular motion is a variety; 3, irregular, in direction. Of a translated body, the path is that of a point, the centre of mass, and is called the trajectory. By the speed or velocity of a moving body is to be understood the relative swiftness or rate of the motion. It is determined by the length of the path described in a unit of time, as the number of feet or parts of a foot traversed in one second. The most general division of velocities is into two kinds: 1, uniform; 2, variable, as when in equal times equal spaces are not passed over. The latter kind are then divided into: 1, irregularly variable; 2, continuously variable, or that which increases or diminishes by equal amounts in equal times; this is subdivided into: 1, uniformly accelerated velocity, in which the change is by equal increments; 2, uniformly retarded, in which it is by equal decrements. In a uniform velocity, V , the time being T , and the space S , it is evident that $S = VT$; whence $T = \frac{S}{V}$, and $V = \frac{S}{T}$. In lifting a weight, we may say that we exert force which gravitation resists; or that gravitation is exerting on the body a force which we resist; both expressions are correct. It follows that force and resistance (active) are differently named only for convenience; the terms are convertible; but we conveniently call that a force which produces, and that a resistance which opposes, useful effect. But when we exert force against an immovable obstacle, or when a moving body loses part of its velocity in imparting motion to one previously at rest, the resistance experienced in either case is passive, not active; the body impinged on merely subtracts so much momentum or force from that acting on it. This passive sort of agency is never a force, but is a true resistance; though in the theory of mechanism, three like agencies, friction, fluid media, and rigidity of cordage or of bending pieces, take the name of the passive or resisting forces. True mechanical forces are of two kinds: 1, impulsive, or acting during an extremely small period of time; 2, incessant, or continued. The latter are subdivided into: 1, constant, in which the energy of application is uniform, as is true

of terrestrial gravity at a given place and elevation upon the earth; 2, variable, as is the moving force of wind passing over any fixed obstacle; and a variable force may be uniformly augmented or diminished, or irregular. A force may be measured and expressed in units of two kinds, the pressure it produces at a given moment, or the space through which it can urge a body in a given time. Weight is the form in which the first of these measures is usually taken; the unit may be one ton or one pound, &c. In the latter, if the velocity occasioned be uniform, the force $F = MV$; and hence, it is measured by the velocity it can impart to a unit of mass. If the force be constant, and V be now used to represent the velocity it can generate in a unit of time, then again $F = MV$; and the measure is the velocity the force can generate in a unit of mass in a unit of time. Motions and forces irregularly variable usually require to be averaged or summed by methods proper to analytical geometry or the calculus. The leading statical and dynamical cases will be presented under the 8 heads following.

I. Composition and Resolution of Forces or Motions. The effect and value of a mechanical force will depend on three circumstances: 1, its magnitude, or intensity; 2, the direction in which it is applied to the body acted on; 3, the relation of the point of application to the centre of mass. Evidently, mechanical forces must admit of addition or subtraction. If three horses pull in parallel directions upon a load, whether with equal or unequal effort, the amount of force they together apply is the sum of their separate forces. Any number of forces, applied on the same side of a body at the same time and in the same direction, may be replaced by a single force in that direction, applied at the common point or some intermediate one, and equal to their sum. The separate forces, or parts, are termed components; the equivalent, or total, is the resultant; the case is one of composition of forces. But of forces acting in opposite directions, the resultant is the difference, and takes effect in the direction of the greater. When the opposing forces are equal, their sum is 0, and the result is equilibrium. Of this an illustration is found in the dead pull resulting at the moment when two wrestlers put forth precisely equal efforts, so that neither can move the other. But the most important case of composition is that of forces acting in directions oblique to each other. Suppose in the same instant a body receives two impulses, one that alone would carry it northward 8 feet in one second, the other in the same time eastward 4 feet; then, at the end of the time the body is found at the opposite angle of a parallelogram, the adjacent sides of which are 8 and 4 feet respectively. The body being freely movable, this result is invariable. It is generalized in the proposition known as the parallelogram of forces: If two forces acting on a body at the same time are representable in quantity and direction by the adjacent sides of a parallelogram, their resultant

will be, in amount and direction, such a force as is represented by the diagonal of the parallelogram. This truth is only possible, however, through the existence of the further principle, which it therefore proves, that two or more motions or forces may coexist in the same body and in the same time, each having its full and proper effect. That is, no force is destroyed by the simultaneous action of one or more others; a body already in motion is relatively to any new force the same as at rest; and a body can move, or press, in such a line as to obey perfectly at the same time two motions or pressures imparted to it. This is the substance of the so called "second law" of motion, which first received a formal statement by Galileo in 1680, but was more fully established by Newton. Whether this law is susceptible of demonstration is doubted; it seems rather to be an axiom drawn from experience and reflection, and corroborated by the conformity of all subsequent observations. But a body can as well obey in the same time three, or any number of forces, the resultant of the first two with a third component yielding a second resultant, and so on; or if the forces be represented by all the sides of a polygon but one, taken around in a common direction, the resultant will be the remaining side, taken in the corresponding direction. But if the resultant of two forces answering to the sides of an oblong be that shown by the diagonal of the oblong, then it follows that a force in magnitude represented by such diagonal, and acting in the opposite direction, is just that which is required to counteract the effect of the two components first named; and when such force is applied, the result will be equilibrium; the body will be held at rest. The three forces in this case correspond to the three sides of a triangle taken around in a continuous order; so that this statical case has been termed that of the triangle of forces. The principle in this form was distinctly announced and applied by Simon Stevin, or Stevinus, of Bruges, in 1586. So, with any number of forces tending to give motion, and represented by all the sides of a polygon but one, the remaining side taken in the reverse direction is the force requisite, to preserve the body in equilibrium, under the impulsion of all the others. The motions resulting in these cases are often called compound; they are exemplified in a multitude of instances, as in the movements of cannon balls, discharged from ships moving in the same or some other course; while compound motions and equilibrium are successively illustrated in the interesting phenomena of the common kite. But for the universal truth of the principle, it is evident that, on a base already performing a motion so complicated as that of the earth, no dependence could be placed on the results of the application of forces for the various purposes of labor. If, however, any number of impulses may thus be replaced by a single equivalent, the converse must be true, and a single impulse may be replaced by two or more others having to it the

relation of components; or of any single force, a component in one direction may be neutralized by some pressure, while the other component gives rise to a motion in a third but related direction. In this way, when a ship sails by any wind not directly aft, resolution of the force of the wind must occur. In this separation of a single impulse into parts, we have resolution of the force or motion. To one or both of these principles are traceable all cases of curvilinear and reflected motions, and of rotation. With respect to its action upon any point not in the direction in which it is applied, the product obtained by multiplying the magnitude of any force by the perpendicular distance from such point to the line of such direction, is termed the "moment" of the force. The point taken is the centre of moments; the perpendicular distance is the lever arm of the force; and the product measures the ability of the force so applied to produce rotation about the centre of moments. The resultant moment of any number of forces situated in any manner in space, with reference to any straight line assumed as an axis of moments, is equal to the algebraic sum of the component moments with reference to the same axis. And again, if the system of forces applied to different points of the same body be parallel, the lever arm of their resultant, with reference to an axis at right angles to their direction, is found by dividing the algebraic sum of the moments of the forces by the algebraic sum of the forces. These principles lead us directly from the composition of forces to the principle of centre of gravity; while they also constitute one method of resolving the cases of the six elementary machines. II. *Centre of Gravity.* Each molecule of a coherent body has, of course, its own weight; but being restrained by cohesion, the molecules cannot fall or press independently. The soliciting forces or pressures on all the molecules may be considered parallel; and their direction is toward the centre of the earth. Hence, through every body, considered with reference to terrestrial gravitation, there will be a plane in a vertical direction, on the two sides of which the sum of the moments of the parallel pressures will be the same. The centre of all the pressures, that is, of the weight of the body, is evidently somewhere in this vertical plane. Now suppose the body placed successively in two other positions with reference to the vertical direction; for each of these there will be a different vertical plane, on the two sides of which the moments of pressure will balance. And since the centre of parallel pressures is in each of these three successively vertical planes, it must be at that single point in which the three planes will intersect. This point is termed the centre of gravity. A remarkable and important consequence now is this: since, into whatever position the body be turned, the moments of pressure on all sides of this point must balance each other, it follows that the entire weight of any body or rigidly connected structure whatever is in effect concentrated in the point in re-

lation to it now discovered; so that, in whatever position of the whole, if this point be supported, the entire body is supported, and is, with reference to the attracting body, the earth, at rest. In a single line of homogeneous particles, this point must be at the middle of its length; in any symmetrical and homogeneous surface or film of matter, it must be at the middle point, as in the centre of a circle, and at the point of intersection of the diagonals of a parallelogram. In any surface or solid the parts of which are symmetrical with reference to an axis, the centre of gravity is in that axis; hence, at the centre of a homogeneous sphere, and at the middle point of the axis of a cylinder or prism; while in the cone and pyramid it is at $\frac{1}{4}$ the length of the axis from the base. In irregular solids, the place of this point is found by trial. Suspend the body successively from three different points of its surface, and by an attached plumb line find in each case the direction of the vertical line through the body when it has come to rest; these three lines will intersect in a point, and this will be the centre of gravity of the body. The vertical line through the point of suspension of a freely hanging body, which has come to rest, must pass through this point, and also through the centre of the earth's mass. It is the line of the resultant of the action of all the particles of the earth and of the body mutually upon each other. This line is of course different for different points on the earth's surface; and it is known as the "line of direction." It is for any place the line in which a free body tends to fall, and in which a supported object, as a wall or structure, must press. Hence the obvious value of the indications of the plumb line, whose direction is at any place that of the line under consideration. The centre of gravity of any system of bodies, connected in construction, or separately placed in space, as the sun, earth, and moon, is readily found; and in cases of the latter kind it is often some point in free space. Join the centres of mass of any two of the bodies by a straight line, and the common centre of these two bodies will be in this line, at a point whose distances from the two centres of mass are inversely as the masses; join this point with the centre of mass of a third body, and at the point first found will be the combined weight of the first two bodies, and the distances of the new centre of gravity from this point and the centre of mass of the third body are found as before; and so proceed until all the parts or bodies are included. The common centre of gravity of the sun, earth, and moon lies far within the surface of the first of these bodies. A body so placed that the line of direction falls without the supporting base, must overturn or roll, and continue so to do until it can come to rest with this line falling within such base. If the support be at points or lines, as in case of the feet of the quadruped or of man, the base is the entire polygon of surface included by lines joining the extreme points, and hence is greater or less in different positions of these

supports. The stability of any body or structure is the relative capacity it has of resisting causes that tend to overthrow it. This stability, when present, is imparted by gravity, the very agent to which overturning is also due; the circumstance which determines the one result or the other is the position of the centre of gravity, and hence of the line of direction, with reference to the surface of support. A body or structure is more stable in proportion: 1, as the area of the base is larger; 2, as the base is more nearly perpendicular to the line of direction; 3, as the centre of gravity is lower; and, generalizing all these conditions, the body is more stable as, in order to overturn it, the centre of gravity must be lifted through a greater extent. It is the necessity of maintaining the stability of our own bodies, that controls all our postures and attitudes. Again, since support may be rendered to a heavy body in three ways, at the centre of weight, above, or beneath it, there are corresponding three kinds of equilibrium: 1, in the first case, neutral or indifferent equilibrium, the body resting in any position; 2, stable equilibrium, as in the case of the pendulum, which, if disturbed, tends always back to a state of rest; 3, unstable equilibrium, the body overturning upon the least deflection from the vertical. III. *The Laws of Falling Bodies.* The ancients looked upon rest as the natural state of bodies; and reasoning from the actual movements of the planets and of water when made to whirl, as well as led by a fancied perfection of the circle, they concluded that motions actually produced tend to take place in a circular direction. The true doctrine was possible only after arriving at the conception of bodies as wholly inert. Galileo, and still more clearly Newton, found the circular motion to be always due to at least two forces; and as one result flowing from such discovery, we arrive at the "first law" of motion, which may be thus expressed: Any body tends to persist for ever in the condition in which, whether of rest or of motion, it may be at the time; and if in motion, to advance continually at uniform speed and in a straight line. But a body free to move must have motion communicated to it by the smallest imaginable impulse; the velocity imparted when the impulse is a fixed quantity being directly proportional to the magnitude of the latter, and inversely as the mass acted on; or,

V varies as $\frac{F}{M}$. In the case of bodies gravitating toward the earth, however, F is not a fixed quantity; each new molecule in the mass acted on is attracted with the same energy as any molecule previously in the mass; so that the attraction increases always in the exact ratio of the number of molecules; $\frac{F}{M}$ is a constant ratio, and V therefore a constant quantity; or in other words, at a given distance from the earth's centre, bodies large or small must fall with the same velocity, not with velocities in proportion to their weights, as taught by the

early philosophers. This truth is proved by the familiar experiment in which, *in vacuo*, a guinea and a feather fall with the same velocity. In lat. 45° , at the sea level, and *in vacuo*, a body falling freely descends through 16.0847725 feet, or very nearly $16\frac{1}{2}$ feet = 193 inches, in the first second of time. But, gravity being, for distances from the earth's centre that are nearly the same, in effect a uniform or constant force, it is equivalent to a number of impulses repeated uniformly through the second. The body, starting at 0 of velocity, has its average velocity at the end of the first half second; hence, at the end of the second, it has double the average velocity of that period; hence, no new impulse being given to it, it would describe in the 2d second double the distance of the first, and, when the effect of the renewed action of gravity during this second is added, three times the distance of the first, or about 48 feet; and therefore, calling $16 = g$, in the first two seconds, $g + 3g = 4g = (2)^2 \times g = g.T^2 = 64$ ft. nearly. By pursuing the same line of reasoning, all the relations of spaces and velocities of falling bodies, for any required times, are readily deduced, as in the following table:

| Time, in the order of seconds. | Spaces in successive seconds. | Whole times in seconds. | Spaces in whole times. | Velocities acquired at end of whole times. |
|--------------------------------|-------------------------------|-------------------------|------------------------|--|
| 1st..... | $g = 16\frac{1}{16}$ | 1 | $16\frac{1}{16}$ | $2g$ |
| 2d..... | $3g$ | 2 | $64\frac{1}{4}$ | $4g$ |
| 3d..... | $5g$ | 3 | $144\frac{9}{16}$ | $6g$ |
| 4th..... | $7g$ | 4 | $257\frac{7}{8}$ | $8g$ |
| 5th..... | $9g$ | 5 | $405\frac{9}{16}$ | $10g$ |
| 6th..... | $11g$ | 6 | 576 | $12g$ |
| 10th..... | $19g$ | 10 | $1600\frac{9}{16}$ | $20g$ |

&c. An inspection of this table will at once show certain laws of the spaces and velocities, all that are ordinarily required of which are expressed in the following formulas. Calling the space described in the first second g , the whole space H , the time in seconds T , and the velocity V , then $H = g.T^2 = \frac{V^2}{4g}$; $V = 2g.T = 2\sqrt{g.H}$;

$T = \frac{V}{2g} = \sqrt{\frac{H}{g}}$. When a body is projected down-

ward, the uniform movement due to projection is added to the uniformly accelerated motion due to gravity; and calling h the space moved through in consequence of projection in each second, the whole space described in a given time is, $H = g.T^2 + h.T$. When a body is projected upward, gravitation acts as a uniformly retarding force; hence, theoretically, such a body must rise to the same height as that through which it would have to fall, to acquire a final velocity equal to the initial velocity of projection; it will lose $32\frac{1}{2}$ feet of velocity in each second; and generally, the relations of spaces and times already found will hold true of its motion, in the reverse order. The same laws serve for the case of a body rolling down or projected up an inclined plane; the unit, however, or descent from a state of rest in the first second, is different, being such part of g as the height of the incline is of its slant length.

Into the theory, as now stated, some disturbances enter, chiefly those due to resistance of the air and the revolution of the earth. By the first cause, the velocity of fall is lessened, and the time prolonged. A ball of lead was found to be $4\frac{1}{2}$ seconds in dropping from the lantern of St. Paul's to the pavement, a distance of 272 feet; while by theory it should have fallen 324 feet in the same time. As the speed of fall is augmented, so also is the resistance of the air; the result being that a sphere of lead $\frac{1}{2}$ inch in diameter cannot attain to a velocity greater than about 117 feet per second; a like drop of water 86 feet, and a sphere of cork 18 feet. Falling rain and hail are thus limited to a comparatively moderate velocity. A body projected upward does not rise to the height indicated by the theory; and yet it is longer in falling than in rising. To a like cause, as well as to the fact that our impression of the speed acquired during falling is usually erroneous—such speed increasing, not as the whole height, but in the less ratio of the double of the number of seconds—and in part also to other influences, is due the impunity, sometimes quite astonishing, of a certain proportion of the cases of persons, especially children, falling from considerable heights. Again, owing to the revolution of the earth, a body let fall deviates from the vertical, in the northern hemisphere, slightly to S. E.; in the southern, to N. E.; while a body projected upward lags somewhat, and falls, north of the equator, to S. W.; south of it, to N. W. IV. *Projectiles*. A heavy body discharged in any direction through a medium, as the air, is a projectile. The fundamental fact of the theory of such motions is, that the projected body, flying through the air with any velocity whatever, perfectly obeys in and for the same period of time the laws of a falling, or, as the case may be, of an ascending body. The projectile is acted upon by gravitation, in precisely the same manner as if dropped from a state of rest. Hence, the air being supposed removed, a ball fired horizontally from the top of a tower 257 feet high, will reach the ground in precisely the same time, whether the horizontal velocity be less or more; namely, in 4 seconds. The projectile, therefore, advances along a curve, the horizontal distances of which for as many seconds, *i. e.*, the abscissas, are 1, 2, 3, 4, &c.; while the vertical distances measured from above, *i. e.*, the ordinates, are $1^2, 2^2, 3^2, 4^2$, &c. But any curve so determined is a parabola; and this, in whatever oblique direction the discharge, is in theory the true geometrical character of the path of a projectile. The horizontal distance of flight is the range or random of the shot; the angle the axis of the gun makes with the horizon, is the elevation. To Galileo, who first developed the effect of a uniformly accelerating force, and the law of a falling body, we owe also this first and most obvious deduction—the theory of projectiles. From known relations of parts of a parabola, he deduced the following consequences: the range is

a maximum when the elevation is 45° ; and for equal deviations above and below, say for 70° and 20° , the range is equal; incidentally, therefore, the higher elevation is preferable when obstacles, as walls, intervene; the time of flight is increased as the elevation is greater; and this, as well as the height reached, is a maximum when the projection is vertically upward; and finally, fired at any elevation, a body can only remain in the air a given time, and hence, to fly further, should receive a greater initial velocity. The theory, thus developed, is useful as a basis only; the business of loading, and taking aim, so as to secure the desired execution, is largely modified by considerations such as the resistance of the air, and the nature of the materials at command; and thus modified, constitutes the practical subject of gunnery. It may be added here, however, that the principles remaining most nearly true in practice, are those relating to greatest height, time of flight, and, within certain limits, the increase of range by increase of velocity. When we remember that the action of moving air has overthrown strong edifices, and lifted and transported very heavy bodies, even cannon and rocks, it will be evident that the reaction of air at rest against balls or bullets flying at a speed greater than that of the most rapid tornado, must be enormously great. A speed of projection however great is thus very soon reduced to one of less than 1,100 feet per second; and the actual path of the ball is in a curve deviating within the parabolic, and more rapidly at the last, and called the ballistic curve. For the explanation of the deviation of projectiles to the right, in consequence of the rotation of the earth, see *GYROSCOPE*. This deviation, in a ball fired due south 5,600 yards, has been observed as amounting to nearly 11 yards. V. *Rotation and Centrifugal Force*. For the nature of rotation, composition of rotations, and the gyroscope, see *GYROSCOPE*. If a disk or globe be turned, since all circumferences are as their diameters, and hence as their radii, it is obvious that a particle so far from the axis of rotation as to have its radius twice that of some nearer particle, will during a revolution or any part of one describe an actual path just twice as long as that of the nearer particle; one at three times the distance, a path three times as long, &c. Thus, while the actual velocities of the particles will increase as their radii, the ratio of any such velocity to the corresponding radius remains always the same; this constant ratio of velocity to radius, in a turning body, is called the angular velocity, expresses its velocity as a whole, or at a unit of radius, and may be marked V_1 . To this quantity are directly related the moment of inertia of a rotating body, and hence also its living force or quantity of action, the work of a force expended in bringing into rotation at any given rate a mass of known magnitude and form, and the quantity of moving force such a mass so rotating can accumulate, and which, as in a fly-wheel, it can again expend in overcoming

irregularities of movement of machinery, or in performing direct labor, as of coining, shearing and punching metallic plates, &c. Any body or parts of a body describe a circular or elliptical movement only when, having received an impulsion or projection, the moving mass is at the same time drawn or restrained toward a centre or axis of motion, by cohesion of the mass itself or of a connecting cord, or by gravitation, as in the case of the planets, or by the cohesion of a rigid, confining surface without. If the attraction or other restraining force be suddenly removed or overcome, the released body or fragment moves onward from the moment in a straight line, which therefore is tangent to its curvilinear path at the point. Now, since any body tends in virtue of an impulse, momentary or repeated, to move forward in a straight line, its inertia, in which this tendency inheres, becomes in effect a continual pull or reaction outward, or against the restraining force which is at every moment deflecting it into a curved path. The original impulse, tending to give motion in a right line, is the projectile force; the restraining gravitation or cohesion, which deflects the body into a curved path, is the centripetal force; the reaction against this force in a precisely opposite direction, due to inertia, and tending to tear the body outward in a radial line from the centre or axis, is the centrifugal force, so called, but which, being only a reaction, is not a force, and would be more properly named centrifugal pressure, or centrifugence. As an action and a reaction, the centripetal and centrifugal pressures are necessarily equal; or if not so, the path ceases to remain circular. In the case of a whirled ball or turning mass, the centripetal force is seldom the whole cohesion, but is only such part of it as is called into action by the amount of outward pull or pressure, while this latter bears a close relation with the whole momentum imparted by the force of projection. When the centripetal action has been in any way overcome, the force with which the body then moves off in a tangent to its curvilinear path is identical with the original force of projection, or with such part of it as remains; it is sometimes named the tangential force. The centrifugal pressure, C , of a mass M , revolving with an effective radius R , is $C = \frac{Mv^2}{R}$; and in terms of gravity, the weight being W , $C = \frac{W}{g} \cdot \frac{v^2}{R} = \frac{Mv^2}{R}$. In a turning body, the number of revolutions in a given time being N , $C = \frac{W}{g} \cdot \frac{4\pi^2 R N^2}{1} = 1.2275 \cdot W \cdot R \cdot N^2$. And generally, for any whirled body, C varies as the product $W \cdot R \cdot V_1^2$; that is, as the weight of the body, into radius, into the square of the angular velocity. Familiar illustrations of centrifugal pressure are numerous; as, in the hurling of stones from a sling; the tendency of the rider in a circle, or of a carriage turning a corner, to be overthrown outward; the bursting and projection of grindstones or wheels too rapidly turned; the dishing outward and upward of the water to-

ward the edge of a whirlpool; and the meandering of streams which, deflected from one bank, are then borne against the opposite. Important applications in mechanism are seen in the machinery for sugar drying, in certain blowing machines, for furnaces, ventilation, &c., and in various forms of centrifugal pump. VI. *Oscillatory Motion; the Pendulum.* If a suspended body have its centre of mass drawn aside from the vertical line through the point of suspension, and be then released, it is by gravitation caused to move back to such vertical; but in thus descending it has acquired a momentum which, were there no impediments to the motion, must carry it through exactly the same distance on the opposite side, when it would be brought to rest, and return; and this movement would be repeated indefinitely. The movement consists in an excursion and return, through a circular arc, larger or smaller; it may be considered as a partial and alternating rotation; and it is termed oscillation, or vibration. The excursion and return constitute a double oscillation; either one of these, a single or simple oscillation; the point from which the swinging mass is suspended is the centre of suspension; the length of arc described is the amplitude, and the period in which it is described, the time, of an oscillation. Generally, the velocity acquired by a body descending, without friction, a curve vertically placed, equals at any point that which would be acquired in falling freely through the vertical depth of the curve to the same point; the time of descent depends on the nature of the curve. Now, in a circular arc, the time of vibration increases measurably when the amplitude increases; though by an extremely slight amount, until after the arc is made to exceed 2° . To obtain isochronous (equal-timed) vibrations, some other curve must be resorted to; and the cycloid, among other singular properties, has that also of causing an unresisted movement through its whole extent to occupy precisely the same time with an oscillation through any less arc of the curve, at its lowest part, and greater than 0. The importance of this problem of obtaining isochronous vibrations has arisen out of the use of a vibrating rod and ball—the pendulum—for dividing and indicating time, especially in nice philosophical investigations. The pendulum, as used, is distinguished as the actual or material pendulum; a true oscillatory motion would be exemplified by a single heavy particle at the end of a line destitute of weight, and this theoretical conception is spoken of as the mathematical or simple pendulum. The evolute of the cycloid consists of two reversed semi-cycloids, termed in practice the cycloidal cheeks. The line unwrapping from and wrapping upon these, the heavy particle moves in a cycloidal arc. The length of rod is just double the diameter of the generating circle. Now, from relations of parts of the cycloid it is shown, that the time of falling down the semi-cycloid is to the time of fall through the diameter of the generating circle, as quad-

rant of a circle to radius; that is, the time of a half vibration is to the time of falling down half the length of the pendulum, as the semi-circumference of a circle to its diameter; or,

$$\frac{T}{\frac{1}{2}} : \sqrt{\frac{L}{2g}} :: \frac{\pi}{2} : 1; \text{ whence, } T : \sqrt{\frac{L}{2g}} :: \pi : 1; \text{ and}$$

$$T = \pi \sqrt{\frac{L}{2g}}. \text{ From this expression either the}$$

time or the length of the pendulum is obtained, when the other is known. As a consequence of the relation shown, also, π and $2g$ being constant, T varies as L ; that is, for the cycloid, the time of vibration depends on the length of the pendulum only, and is independent of the length of arc. Again, for different times, the lengths will vary as the squares of the times; so that, the length of a pendulum vibrating seconds in New York having been found by careful determination to be 39.10158 inches, that beating tenths of seconds must be about .391 inch long; beating once in 2 seconds, 156.4 inches; and so on. The practical length of a pendulum is the distance between the centre of suspension and another point theoretically determined as follows: If a uniform homogeneous rod be made to swing, the particles above the middle of its length tend to vibrate in less times than one at the middle; those below in longer times. But the whole quantity of action in the lower is also greater than that in the upper half, and the parts are by their cohesion constrained to move together; hence, at some part of the length of the rod there must be a particle that, owing to the length of the rod above it, would if alone vibrate in the same times as the whole rod actually does. In the rod supposed, this is at $\frac{1}{2}$ the whole length below the centre of suspension; it is the point in which the whole moving force of the swinging rod is concentrated, and hence is called the centre of oscillation. The effective length of every pendulum, now, is the distance between these two centres; and for convenience we lower this point, which is always below the centre of gravity, as much as possible, by collecting the matter of the pendulum mainly in a ball at its lower extremity. The inconvenience of the contrivance for securing cycloidal arcs has led to a return in practice to those that are circular; and this is the more readily done in view of the fact that oscillations in very small circular arcs approach almost exactly the cycloidal; while the elasticity of the thin tongue or ribbon of steel inserted to form the upper end of the rod, may be made to compensate the slight retardation, and secure almost absolute isochronism. Any weapon or implement, as a club or axe, which is swung, is in effect a pendulum; the point in which its moving force is concentrated is termed the centre of percussion, and is identical with that of oscillation. In order to exert upon the object struck the full effect of the blow, the impingence must be in the line of motion of this point; otherwise, part of the moving force remains unexpended, tends to rotate the weapon,

and inflicts a blow on the hands. VII. *Reaction, Momentum, and Collision of Bodies.* An invariable experience assures us that we cannot exert force upon that which opposes to such force no resistance. A blow is only possible when and to the extent to which the body struck inflicts on that striking it a counter blow. The body that attracts is equally attracted, and there is no push or pull actually applied save by means of an equal push or pull in return. This is as true when the body moves under the impulsion, as when it remains at rest; it will move only when and as its capability of acting against the force applied is less than the capability of action on the part of the force; but, in moving, it still acts back to the amount of the impulse it really experiences. The truth here discovered was generalized by Newton in the "third law" of motion, viz.: that to every action there is opposed an equal reaction; and this law holds alike for cases of pressure, collision, attraction, and repulsion. Unless, indeed, as now shown, force always pulls or pushes against force, there would be no fixed point, or point of application, and no effect. Aristotle had a glimpse of this principle, when he wrote: "Neither very small (light) nor very large (heavy) bodies can be thrown far;" adding the suggestion that the large body reacts so greatly, the small one so little, that there can be no throw or push. Yet Arriaga, as late as 1689, was troubled to know how, when several flat weights lie one upon another on a board, any but the lowest should exert pressure on the board; and Cardan about the same time puzzled himself with the question: "If two men each draw half a weight, should they not together draw $\frac{1}{2}$ of $\frac{1}{2} = \frac{1}{4}$ of the weight?" In another view, the law of reaction may be thus expressed: every change produced consumes the changing force; hence, in the disappearance of the acting force, the apparent rebut. The shock felt in a body arrested when in motion, is not so much a shock given to it by the body stopping it, but rather that arising by its own surrender of moving force, and stopping in consequence. Examples of action and reaction are numerous and familiar; none show the nature of the case better than that of a person pulling a boat in which he may be to shore; if the other end of the rope be attached to a post, this must pull in the opposite direction with the same force that he applies; for if a second man now take the place of the post, though the boat is moved only as rapidly as before, yet if the latter do not exert himself just as much as the former is doing, the movement of the boat flags, and the workman on shore is drawn into the water. The quantity of motion in a moving body, as indicated by the instantaneous blow it will impart to another movable object, is called the moving force or momentum, m , and its measure is $m = MV$; so that the momentum of a body is doubled by doubling either the mass or the velocity, and quadrupled when both these are doubled. The effect of momentum of a solid

body is seen in the blow of a cannon ball, and in the force with which a ship under sail strikes a rock, or crushes a small boat against a wharf; of a liquid body, in the energy imparted to water wheels, and in the devastation of torrents; of the air, in the impulsion of windmills and sailing ships, and the resistless sweep of the tornado. But while the measure of the power to inflict a momentary blow is that already stated, the case is different where the moving body has time to expend on the obstacle the whole work of which it is capable. It is then found to give a quantity of effect, which varies as the product, not of M into V , but into V^2 . But a body cannot thus restore more force than it has previously stored. Hence, to overcome all the inertia of a body moving with a certain velocity, or to impress on it at rest such velocity, the same whole quantity of action must in either case be exerted, and expended upon the body; this quantity of action is measured by $Q = \frac{1}{2} M V^2$; it is equal to the whole work exerted by gravity upon a body during its descent through the space through which it must fall freely to acquire the given velocity V , and hence, to the whole of the constant effort that must be exerted to uphold the body against gravity during the corresponding time; that is, again, to the work expended in moving a working point against a uniform equal resistance during the same time. Either of the three quantities last stated is a certain weight W , overcome through a certain height or distance H ; hence, for any one of these cases, $WH = \frac{1}{2} M V^2$. The quantity which is commonly known as the living force impressed during a certain action, or the *vis viva*, L , is the double of the quantity now found; or, $L = M V^2$. It is through an oversight of the necessary truth, in mechanics, that no body or machine can restore or expend a greater amount of force than it has been previously allowed to store or accumulate, or that no machine can within itself originate any moving energy, that the greater number of those predestined failures or frauds known as "perpetual motions" are undertaken. In the collision of inelastic bodies, both movable, one law properly interpreted covers all the cases: after collision, if their impact be in the line of their centres, and their moving forces equal, the bodies will both come to rest; if their moving forces be unequal, the motion will continue in the direction of the greater, and will be represented in velocity by the quotient obtained by dividing the algebraic sum of the momenta by the sum of the masses; or, $V' = \frac{M V + M' V'}{M + M'}$. So, all cases in which equal and perfectly elastic masses meet in their line of centres, are included in the single law, that the bodies, after impact, interchange velocities. VIII. *Elements of Machinery.* The necessity of overcoming a variety of mechanical resistances has confronted mankind from the earliest times; muscular power and certain external agencies quite as obviously presented themselves as the means.

But many of the resistances are too great to be thus directly attempted, or the power at hand is not in a form suited to them; hence the need of devices or contrivances for modifying the power or its effect. These, if highly simple and obvious, so as to partake but slightly of the character of machines, constitute tools; as a knife, a hammer, &c. On the other hand, if we thrust a long inflexible bar against an obstacle, or pull on it with a rope, the force exerted at one point is made available at a distant one. So, with a bar and prop suitably arranged, we overturn or lift a body of great weight; the power is exerted to unexpected advantage. Here discovery and ingenuity are more distinctly involved; and the result—a machine proper—we may define to be any contrivance by which the effect of a force is transmitted, being usually also, within a given time, augmented, diminished, or otherwise modified to the advantage of the user. In respect to their purposes, machines have been variously classified, but perhaps never completely. Rankine names two general divisions—machines for observing, and for work. Among the former are those for counting, measuring, copying or drawing, weighing, recording, &c. Working machines are those for: 1, lifting and lowering solid weights; 2, horizontal transporting of weights; 3, projecting of solid bodies; 4, lifting of fluids; 5, propelling or projecting of fluids; 6, dividing of solid bodies; 7, shaping of bodies by cutting; 8, shaping by pressure; 9, uniting materials into fabrics; 10, printing; 11, producing of sound; 12, miscellaneous purposes. In their relations to power and motion, the uses of machines are: 1, for transmitting force; 2, changing the direction of its action; 3, increasing or diminishing the velocity of movement, as in wheel work; hence, 4, prolonging action of the power, as in the watch; 5, changing the intensity of the effect, as with compound levers and pulleys; 6, changing the kind of motion, as from a rotating to a reciprocating (forth and back) movement, or some other; hence, 7, reducing the time of labor, as with the locomotive; 8, determining the nature of the effect to be produced, as is done by the last piece in mills, factories, &c.; hence, 9, insuring accuracy and uniformity of effect, as in the use of lathes. In every machine, a certain moving power or motor, the amount of application of which during a given time is P , is brought to act, at the point of application, on the first piece of the machine, called the “receiver” or “prime mover;” from this transmitted through various connections, communicators, to the last piece; this, urged directly against the resistance, is the “working part or piece;” the point at which it acts on the resistance is the working point. At such point, or collection of points, the resistance, weight, or load is moved or overcome; its amount is W . If a horse draw a load, the uniform or the average pull, as shown by the dynamometer, against friction and all resistances, being supposed 120 lbs., and through a distance of

50 feet, he performs precisely the work that, similarly harnessed and walking over the same ground, he must perform in elevating from a pit by a rope over a fixed pulley, and supposed to move with no loss from friction or other cause, a weight of 120 lbs. through 50 feet height against the pull of gravity. Properly averaged or summed, the total work of every machine is of like nature, and measurable in like units, whether the resistance be weight, cohesion, inflexibility of materials, friction, or any combination of these. Thus, “mechanical work” consists in moving against mechanical resistance. The capacity of any motor for performing such work is termed its “energy;” the amount of energy at any instant exerted upon the machine is the “effort.” Hence, the mechanical work done upon or through a machine is, universally, the product of a certain mean effort into the length of path through which the effort is exerted, equal to $W.H$, as found in the preceding section. The unit of work, or the unit of power, adopted by mechanists and engineers employing the English language, is one pound weight (avoirdupois) of matter raised without friction through one foot against gravity, termed a foot-pound, and which may be expressed by $p.l.$ The average power of man has been estimated at 100 $p.l.$ per second = 6,000 $p.l.$ per minute = 2,880,000 $p.l.$ for 8 working hours per day. The average power of a draught horse has been taken (probably too large) at 550 $p.l.$ per second = 33,000 $p.l.$ per minute; and this quantity, as a larger unit, used in estimating the power of water wheels, steam engines, &c., is termed a horse power. The French horse power, or *cheval-vapeur*, equals 32,562 $p.l.$ per minute; while the *dynama*, equal to 1,000 *kilog.* \times 1 *mètre* = 7,232.4 $p.l.$, has been proposed. The principal motors are: 1, man, acting by muscular power or by weight; 2, quadrupeds, do. do.; 3, water, by momentum or weight; 4, wind, by momentum; 5, weights, so called; 6, springs, by elasticity; 7, steam, and other aeriform bodies, by expansive or elastic force; 8, electro-magnets; 9, the electric discharge or current, &c. All these find their origin in muscular contractility, gravity, and certain simple attractions and repulsions of the neighboring molecules of bodies. Animate motors exert their power to very different advantage, when the direction of action or other conditions are different. Quadrupeds are less serviceable in carrying than in drawing burdens; least of all, in carrying up or down a considerable slope. The horse works to best advantage in pulling nearly horizontally, walking straight forward, or, if in a circle, of not less than 20 feet radius. The work of carrying and of traction can hardly be compared; in the latter, a good day's work of a horse drawing a cart and load has been estimated at 12,441,600 $p.l.$ A horse may be so loaded that no motion is possible; or his speed may be made the utmost possible, and then he can carry no load. In either case, no work proper is done; there

must be some intermediate speed at which the work (product of resistance into length of path) will be a maximum; and as a rule, this occurs at 4 miles an hour. In carrying loads on his shoulders or up a hill, man becomes relatively superior to the quadrupeds. He exerts his strength to least advantage when reaching up and pushing or pulling horizontally above his head, or when dragging a barge or sledge by a rope over his shoulder; and to the best, when, being nearly erect, he lifts upward, or when seated, he pulls from the direction of the knees, as in rowing. If we call a fair working effort of man 75 *p.l.* per second, that of the ass is about 180, of the ox 800, of the mule 350, and of the draught horse 480, for the same time. The best continued practical working effect of animate motors generally, if the effort be in any degree severe, is obtained when the working hours do not exceed $\frac{1}{4}$ of the 24.—The whole power applied during a given time to any machine, is necessarily equal to the total resistance overcome, or work done, in and through such machine, during the time of expenditure of such power; or, universally, $P.H. = W.H.$ A man whose effort is 75 *p.l.*, can raise so many pounds through 10 feet in 10 seconds; he cannot move at all a load of 600 lbs. But if to this latter load he attach a pulley, supposed frictionless, of 8 cords, he will be enabled to move the load to such extent as will be due to his pulling and taking in 10 feet of the rope per second. His working effort will here as before be 75 *p.l.*; but in order to move the load through 10 feet, he must now exert this effort through 80 feet, in taking in so many feet of rope. If, then, there be no loss, he does the whole work; but is conveniently enabled to lessen the effort required down to his own capability, by distributing it over a longer period. That is, theoretically, the power and the load always move or act, or in case of balancing would do so if movement actually occurred, through spaces or with velocities that are inversely as their own magnitudes. This law, known therefore as that of "virtual velocities," or of "equality of moments" of the power and load, and familiarly expressed by saying that what is gained in power is lost in velocity or in time, is, calling v the velocity of the weight, and V that of the power, formulated thus: $P : W :: v : V$; and this expresses the condition of equilibrium, for rest, of the power and resistance. Hence, the "mechanical advantage," or theoretical gain of power of a machine, known also as the velocity-ratio, is $\frac{W}{P}$ or $\frac{V}{v}$. But in every actual machine, in operation, there will occur more or less both of necessary loss and waste of the power applied, chiefly owing to friction, and in a less degree to the imperfect flexibility of cordage, bands, &c., and to the resistance or adhesion of the fluid medium in which the parts move, and usually augmented by imperfections in the mechanism itself, and in the expenditure of the effort at the working point. The total loss due to these

causes being subtracted from the total work of the power, the remainder is the useful resistance overcome, or useful work performed.

Calling this U , it follows that $\frac{U}{P}$ is the ratio of practical efficiency, and it is called the *modulus* of the machine.—Machines are either simple or complex. The simple machines are commonly known as the "mechanical powers," a very inappropriate term, better replaced by that of elements of mechanism, or elementary machines. Of these, six are usually named: the lever, wheel and axle, pulley, inclined plane, wedge, and screw. The simplest lever is an inflexible bar, propped at some point in its length, and about which it turns; but the modifications of form and appearance are almost without end. The prop is called the fulcrum; measuring from this to the points of application of the power and the weight upon the bar on the two sides, we obtain the lengths of the arms; calling these

A and a , $P : W :: a : A$; so that $\frac{A}{a}$ is the mechanical advantage, or leverage, or ratio of weight to power, required to produce equilibrium. Archimedes properly also explained the lever, by regarding the fulcrum as at the centre of parallel pressures. Levers may be straight, angular, or curved; the power and weight may act at any angles. The universal rule is that P and W balance when they are inversely as the lengths of two lines let fall from the fulcrum perpendicularly to the lines of direction of the action of P and W , respectively. Levers are of three kinds, according to the relative places of the power, weight, and fulcrum F , as in the following systems: 1, $P F W$; 2, $P W F$; 3, $F P W$. Examples of the 1st kind are, the handspike, crowbar, steelyard, balance, pump handle, the shipper handle of locomotives, scissors, pincers, or forceps; of the 2d, the crowbar in lifting, the oar, rudder, slicing knife, hand barrow, nut crackers, or any pole or bar sustaining a load, with power applied at both ends, which is the case of the whiffle-tree; of the 3d, the fishing rod, common safety-valve bar, tongs, or pliers. The first kind of lever may have its arms such as to involve either a gain or a loss of power; the second always affords a gain; the third, always a gain of velocity, at the expense of power. The gain in the compound lever is obviously found by compounding the ratios of the several single levers in it. The wheel and axle consists of a large and small wheel or cylinder rigidly joined so as to move together, and to opposite sides of which respectively the power and load are applied by a winding and an unwinding rope. The common axis is the fulcrum, the respective radii are the lever arms; so that this is a perpetual lever, the gain of power being invariably in the ratio of the radii, or $\frac{R}{r}$. In practice, this device is greatly modified, giving us the steering wheel, or wheel with or without pins in its periphery, as for working brakes and a variety of purposes,

the crank, windlass, capstan, windmill, tread-wheels, lathes, water wheels, in fact all wheel work. The pulley consists of one or more small wheels, turning by means of a cord or rope within a block. The small wheels are sheaves; by workmen the system is termed a block and tackle. Any fixed pulley or set of pulleys affords no gain of power, but serves only to change the direction of its action. The load suspended from a movable pulley bears equally on all the effective parts of the cord, the number of which is double the number of movable pulleys, or $2n$, save that, when the end of the rope is attached to the movable block (the most effective arrangement), it is $2n+1$. In these two commoner forms, the mechanical advantage is therefore, in theory, $\frac{2n}{1}$, and $\frac{2n+1}{1}$. Various

peculiar arrangements, such as the Spanish barton, are resorted to with increased gain of power in particular cases. The inclined plane is a rigid surface sloping at any angle between the horizontal and vertical. The weight of any heavy body or load, placed on a plane so situated, and of course acting vertically downward, is necessarily decomposed into two pressures—a normal component, acting at right angles to the plane, and upheld by it, and a component parallel with the plane, which is the amount of tendency remaining, by which the body can roll or slide down the plane. These components, h and l , are geometrically shown to have to each other the ratio of the height of the plane to its length. The ratio of the weight to the power acting parallel with the plane, required to secure equilibrium on any such plane, is therefore $\frac{l}{h}$. When the power acts parallel with the base,

b , the gain of power becomes less, being in the ratio $\frac{b}{h}$. The uses of the inclined plane are familiar; among them are the slopes employed for launching ships, and the inclines or gradients of railways. The wedge is essentially an inclined plane intended to move, so as to advance against or beneath the load. Much difference of opinion has unnecessarily arisen in respect to the theoretical gain of power in this instrument. Being a moving inclined plane, and in all cases, whatever its actual form or action, in effect a single-sloping body advancing between a fixed resistance on one side and a movable one on the other, its "height" is always equal to the width of its whole back; so that the gain is, in the same cases as above, either $\frac{l}{h}$ or $\frac{b}{h}$, l being its slant length, h its whole back, and b its length in the direction of an axis or base. It is practically difficult to estimate the peculiar kinds of work done by the wedge. Most cutting and sawing implements are among the examples of it. The screw is a cylinder worked by a lever, and having upon it a winding inclined plane, the thread, along which, in effect, the load is always made to advance, being applied by means of a fixed or movable nut, or corresponding hollow screw. While the power at the end

of the lever sweeps through the circumference C , determined by its length as a radius, the load is moved through the vertical distance d , between the corresponding sides of two adjacent turns of the thread. Hence, always, the gain of power is in theory $\frac{C}{d}$, a ratio that may become enormously great. The uses of the screw are familiar. Thus, the so called six are really resolved into two elements of mechanism, the lever and inclined plane. But beside the six now described, there are other devices which scarcely come under any of them; as the knee lever (knee joint), eccentrics, and cams of great variety, unless, indeed, all three of these are resolvable into the wedge with variously curved surfaces; and beside these, Hooke's joint, &c. The practical loss of power in the various simple machines varies, from a very small percentage in the simple lever and wheel and axle, to $\frac{1}{4}$, $\frac{2}{3}$, or $\frac{3}{4}$ the entire power applied, as in compound pulleys and the screw; while in the latter the loss is often, and in the wedge usually, greater than the entire acting load. As a necessary consequence of the loss arising in all machines, when put in motion, the power must always exceed that theoretically found, namely, that which gives equilibrium in the state of rest. If, of the power P required in any machine to balance the load at rest, a part Y is lost, the remainder is U , the useful work; $\frac{U}{P}$ is the part of the theoretical power that takes effect. Hence, to find the practical power necessary to maintain the machinery in motion at a certain speed, it is necessary first to find the value of P by theory, then to find the loss Y at the required speed, to subtract this from P , finding U , and then to increase the power already found in, or to multiply it by, the ratio $\frac{P}{U}$. This will give the practical power required for the given load and speed, and uniform movement at such speed. If the velocity be increased, the loss increases; and the reverse.

MECHELN, or MECKENEN, ISRAEL VON, the name of a German engraver and goldsmith, or according to some of two engravers, father and son, who were probably born in Mecheln, Westphalia, and flourished in the latter half of the 15th and the commencement of the 16th century. From the difference observable in the style of the prints passing under the name, of which upward of 800 are known, it is almost certain that there were two artists named Von Mecheln who practised engraving. Their works are among the earliest specimens of the art. About the latter half of the 16th century flourished an artist of the school of Cologne, whose name has been lost, but to whom, says Kugler, "formerly, though without sufficient ground, that of a contemporary goldsmith and engraver, Israel von Mecheln or Meckenen, was given." He is generally designated as the "master of the Passion," from his chief work, a representation of the Passion on 8 panels. Several other works

by the same hand are extant in Germany, painted in the stiff, Gothic style, with something of the manner of the Van Eycks. By some this unknown artist is supposed to have been identical with Israel von Mecheln the younger.

MECHERINO. See **BEOCAFUMI, DOMENICO.**

MECHI, JOHN JOSEPH, an English agriculturist of Italian extraction, born about 1800. His father removed in early life from Rome to France, and thence to England, where he became attached to the royal household. The son, on account of his proficiency in modern languages, obtained employment in a mercantile house. For the last 25 years he has been engaged in the cutlery and hardware business, and has establishments in various parts of London. "Mechi's magic strop" and liberal advertising have been his passports to fortune. He was elected alderman, and in 1857 was senior sheriff of London and Middlesex. His reputation is however principally owing to his experiments in scientific agriculture on his estate of Tiptree Hall in Essex. He collects the manure in a vast reservoir, liquefies it, and distributes it by a steam engine, through subterraneous pipes over all parts of the farm, which it fertilizes and irrigates at the same time. He has written "Experience in Drainage," "Letters on Agricultural Improvement," and "How to Farm Profitably, or Sayings and Doings of Mr. Alderman Mechi" (London, 1859).

MECHITAR, the founder of a congregation of Armenian monks, called after him Mechitarists, born in Sebaste (Sivas) in Armenia Minor, died April 27, 1749. The name Mechitar (also written Mehitar or Mochtar), which signifies "comforter," was given him on entering a convent of the Antonian monks; his original name was Manuk. He showed in early life an insatiable thirst for knowledge, and a desire to elevate the literary culture of his people to a level with that of the most educated nations of Europe. For this purpose he laid the foundation of a new religious congregation at Constantinople in 1701. The persecution which he and his congregation had to endure on the part of the Armenian patriarch, on account of their union with Rome, induced him to send a number of his disciples to the Morea, at that time belonging to the republic of Venice, from which the congregation received in 1703 permission to build a church and convent at Modon. In 1715, when a war between Venice and Turkey had broken out, Mechitar went, with 11 of his disciples, to Venice, whither the rest of the congregation, about 70 in number, followed him in 1717, after the capture of Modon and the destruction of the buildings by the Turks. The government of Venice gave to the congregation possession of the island San Lazaro, near Venice, "for all future times." Here the congregation soon began to prosper beyond expectation. The Mechitarists take the usual monastic vows, and pledge themselves to go wherever their superiors may send them, and to labor especially for the advancement of a Christian Armenian litera-

ture. The merits of the Mechitarists in this respect are very great. They have not only furnished the best editions of all classic Armenian writers, but also translated a number of standard works of European literature into the Armenian language. Not only Catholic literature, but even works like Ranke's "History of Germany during the Reformation," appear in the list of their publications. Among the most valuable original works composed by them are a "History of Armenia," by Father Tchamtchenanz (died 1823), in 8 vols.; and a "History of Armenian Literature," by Father Somal, abbot of San Lazaro (Venice, 1829). From San Lazaro the congregation have spread to all countries in which Armenians reside, in particular over Italy, Austria (5 houses), Turkey (4 houses), Russia, and Persia. Next to San Lazaro, their most important establishment is that of Vienna, founded in 1810, which has devoted itself to the publication of German Catholic books, and from 1830 to 1850 issued 445,989 volumes. A legacy of a rich Armenian in Madras enabled them to establish a learned institution in Padua, principally for the education of young laymen, as the school of San Lazaro serves mostly for the education of Armenian clergymen. In 1846 they founded a college in Paris, which has already a high reputation.

MECHLIN, or **MECHELEN** (Fr. *Malines*), a Belgian city, in the province of Antwerp, on the Dyle, 12½ m. N. by E. from Brussels, 83 m. E. by S. from Ostend, and 187 m. W. from Cologne; pop. about 80,000. It is the great railway centre of Belgium, the chief lines radiating from the town, which however presents a deserted appearance, vividly contrasting with the bustle at the station, which is ½ m. outside the gates. Mechlin is one of the most picturesque Flemish cities, Kraam street and most other streets abounding with quaint houses and numerous signs over the shops. The Place d'Armes is a very large and handsome square. In the Grande Place is the cathedral and a statue of Margaret of Austria by Geefs. The principal public edifices are the cathedral, the massive, unfinished tower of which is 348 feet high, the churches of Notre Dame, St. Peter and St. Paul, St. John the Baptist, and St. John the Evangelist; the archiepiscopal palace; the Beguinage, an asylum for aged widows; and the college. There are manufactories of woollens, linens, lace, beer, &c. The lace manufacture, formerly celebrated, has greatly fallen off both in quantity and quality. Mechlin is the seat of an archbishop, who is primate of Belgium, and has authority over 8 suffragans. Its churches contain some fine paintings by Rubens and Vandyke.

MECKLENBURG. I. A S. E. co. of Va., bordering on N. C., bounded N. by the Meherrin river, intersected by the Roanoke and drained by its tributaries; area, 640 sq. m.; pop. in 1850, 20,680, of whom 12,462 were slaves. The surface is undulating and well timbered, and the soil generally fertile. The productions in 1850 were 113,016 bushels of wheat, 552,468

of Indian corn, 4,868,184 lbs. of tobacco, and 25,655 of wool. There were 8 grist mills, 10 saw mills, 4 tanneries, 80 churches, and 574 pupils attending public schools. Value of real estate in 1856, \$3,527,264; increase since 1850, 29 per cent. Capital, Boydtown. II. A S. W. co. of N. O., bordering on S. O., bounded W. by the Catawba river; area estimated at 700 sq. m.; pop. in 1850, 13,914, of whom 5,478 were slaves. It has an elevated surface and fertile soil, and contains several gold mines. The productions in 1850 were 56,375 bushels of wheat, 549,162 of Indian corn, and 4,219 bales of cotton. There were 25 grist mills, 2 saw mills, 8 tanneries, 31 churches, and 1,354 pupils attending public schools. The Charlotte and South Carolina and the North Carolina central railroads have their termini at the capital, Charlotte. The people of Mecklenburg took an early and spirited part in the resistance to Great Britain; and in May, 1775, they publicly renounced allegiance to the crown and proclaimed their independence.

MECKLENBURG, a territory of northern Germany, divided into the two grand duchies of Mecklenburg-Schwerin and Mecklenburg-Strelitz, bounded N. by the Baltic sea, N. E. by Pomerania, S. E. and S. by Brandenburg, S. W. by Lüneburg, and W. by Lauenburg and Lübeck; area, 5,401 sq. m. The house of Mecklenburg is the oldest in Germany. Carlyle in his "Frederic the Great" says: "Mecklenburg is reckoned peculiarly Wendish. There are still to be seen there the physiognomies of a Wendish or Vandalic type, more of cheek than there ought to be, and less of brow; otherwise good enough physiognomies of their kind." The original inhabitants of Mecklenburg were of Germanic race, but were conquered during the great migration of nations by Slavic tribes. After long wars against the German monarchs, under the lead of native princes, the country was conquered by Henry the Lion of Saxony, who divided it among his nobles, and gave a part of it to Pribislav, the descendant of a native dynasty, under the name of the principality of Mecklenburg. The reigning house was subsequently divided into two branches. The elder line was founded by Johannes Theologus, whose grandson Henry II. (1802-'29) enriched it by the domain of Stargard. The sons of the latter, Albrecht and Johann, were made dukes in 1849; and a great-grandson of the former became duke of the whole of Mecklenburg. Afterward it was again divided into two lines until 1627, when, on account of a supposed alliance with Denmark, Wallenstein was made ruler of the country. In 1632 the expelled dukes were restored to power by Gustavus Adolphus, and shortly after the final division of the country into the two parts took place.—**MECKLENBURG-SCHWERIN** has an area of 4,701 sq. m.; pop. in 1858, 542,148, chiefly Lutherans. A ridge of hills traverses the country, but its surface is generally level. It abounds with forests and lakes. Lake Muritz is the largest, and Lake Malchiner most

remarkable for its fine scenery. The chief river is the Warnow, which at Rostock expands to a breadth of about 2,500 feet, and falls into the sea at Warnemünde. The soil is fertile and well cultivated. Agriculture is the chief employment of the population. The principal product is wheat. Horned cattle, horses, and sheep are numerous. The exports were valued in 1857 at \$20,000,000, and the imports at near \$10,000,000. The registered shipping comprised in 1859 nearly 400 seafaring vessels and 6 steamers, beside about 60 coasting vessels. The principal seat of learning is the university of Rostock, beside which there are 5 gymnasia, a normal school, and 50 public schools. The seat of the supreme court of appeal for Mecklenburg-Schwerin as well as for Mecklenburg-Strelitz is Rostock, the legislature of the two duchies being united, and assembling at Sternberg and Malchin alternately. The grand duke (in 1860, Frederic Francis), assisted by a ministry of state, wields the executive power, and proposes laws, which must be ratified by the legislature, who must also give their consent to the imposition of taxes. The legislature consists of about 600 rich and powerful land owners, chiefly nobles, and of the deputies of the towns. In 1849 a new constitution was promulgated, but it was opposed by the legislature, and withdrawn in 1850. The aggregate receipts and expenditures are about \$5,000,000 annually. The public debt is \$600,000. The military force comprises 5,880 men, 1,408 horses, and 14 cannons. The country is divided into the provinces of Mecklenburg and Wendt, the principality of Schwerin, the city of Rostock, and the lordship of Wismar. It contains 40 towns, the largest of which, and the principal trading port, is Rostock. Capital, Schwerin.—**MECKLENBURG-STRELITZ** consists of two distinct portions, viz.: the duchy of Strelitz or county of Stargard (area, 560 sq. m.; pop. in 1851, 83,276) on the E., and the principality of Ratzeburg (area, 140 sq. m.; pop. 16,352) on the W. of Mecklenburg-Schwerin. Stargard contains 53 lakes, of which the Tollen lake is the largest. The principal river there is the Havel, and in Ratzeburg the Trave. The imports and exports amount to about \$500,000. The government is the same as in Mecklenburg-Schwerin, excepting in Ratzeburg, which is not represented in the legislature. The grand duke (in 1860, George, succeeded 1816) is assisted by a cabinet, and is noted for his great wealth. The receipts and expenditures amount to about \$500,000; the public debt amounts to nearly \$1,500,000. The contingent to the federal army consists of 718 men. Capital, Strelitz.

MEDALS. See **NUMISMATICS**.

MEDE, JOSEPH, an English clergyman and author, born in Berden, Essex, in Oct. 1586, died in Cambridge in Oct. 1638. He was graduated at Christ's college, Cambridge, in 1610, and subsequently obtained a fellowship. The most esteemed of his works is the *Clavis Apocalyptica*, which appeared in Latin in 1627, and in English in 1648. This was the first ra-

tional attempt on the part of an English theologian to explain the Apocalypse. A collective edition of his works was published in London in 1672.

MEDEA, a mythical princess, a daughter of *Æetes*, king of Colchia, by the oceanid *Idyia*, or *Hecate*, daughter of *Perses*. She was famous for her skill in sorcery, and it was through her instrumentality that *Jason*, with whom she had fallen in love, was enabled to possess himself of the golden fleece. *Medea* accompanied her lover to Greece (see *ARGONAUTS*), and lived with him as his wife, but was subsequently deserted by *Jason*, who was fascinated by *Creusa*, the daughter of *Creon*, king of Corinth. In the fury of revenge *Medea* destroyed her own children by *Jason*, and sent to *Creusa* a poisoned garment which burned her to death. Then fleeing to Athens in a chariot drawn by winged dragons, she there married *Ægeus*, by whom she had several sons. Having been afterward detected however in laying snares for the destruction of *Theseus*, she was driven from Attica, and withdrew into Asia accompanied by her son *Medus*, who became the founder of the Median nation.

MEDFORD, a township of Middlesex co., Mass., at the head of navigation on Mystic river, 5 m. N. W. from Boston; pop. in 1855, 3,749. The Boston and Lowell railroad passes through this town, and a branch of the Boston and Maine leads to its centre. The town is noted for ship building. From 1800 to 1855, 513 vessels were built here, the tonnage of which was 232,006 tons, and the value \$10,449,270. The other productions are railroad cars, coaches, tin ware, leather, boots and shoes, sashes, doors, blinds, distilled liquors, bread, casks, hats, caps, cabinet ware, saddles, harnesses, and trunks. Tufts college is situated in Medford, on Walnut hill, near the boundary line of the adjoining town of Somerville. It was founded by Universalists, the first steps being taken by a convention at New York in May, 1847, and the subscriptions amounting in 1851 to \$100,000. Medford having been selected as the site of the college, the corner stone of the edifice was laid July 19, 1853, and the building finished in the spring of 1854. It is a brick structure, 100 by 60 feet, and 3 stories high. The college was named in honor of Charles Tufts, who made to it a donation of 70 acres of valuable land for a site. Beside this property, it has received from subscriptions, bequests, and state appropriations nearly \$200,000. It has small but well-selected philosophical and chemical apparatus, a mineralogical cabinet, and a library of 8,000 vols. The institution was opened in Aug. 1854. The president (1860) is the Rev. Hosea Ballou, 2d, D.D., elected in 1853, who is assisted by 4 professors. The number of alumni is 22; of students in 1860, 58.

MEDHURST, WALTER HENRY, an English oriental scholar and missionary, born in London in 1796, died there, Jan. 24, 1857. He was educated for the ministry, and in 1816, under the auspices of the church missionary society,

made a tour through India and Malacca, establishing himself in 1822 in Batavia in the island of Java, where he remained 8 years. During this interval and for several years afterward he pursued his missionary labors also in Borneo and on the coasts of China. After a residence of 2 years in England, he returned to the East, and in 1848 settled in Shanghai. Subsequently he passed 6 years of considerable labor and peril in the interior of China, and in 1856 returned in ill health to London, where he died 8 days after his arrival. Apart from his duties as a missionary, he was an industrious and intelligent student of the languages and literatures of eastern Asia, being well versed in the Chinese, Japanese, Javanese, and other dialects, beside Dutch, French, and English, in all of which he wrote. Beside a Chinese version of the Bible, he was engaged in four works of considerable magnitude and importance: "Chinese Repository" (20 vols., Canton, 1838-'51); "Chinese Miscellanies" (8 vols., Shanghai, 1849-'58); a "Chinese and English Dictionary" (2 vols., Batavia, 1842-'3); and an "English and Chinese Dictionary" (2 vols., Shanghai, 1847-'8). His remaining philological works are: "English and Japanese Vocabulary" (Batavia, 1830); "Dictionary of the Hokkien Dialect" (Macao, 1832-'9); "Translation of a Comparative Vocabulary of the Languages of China, Corea, and Japan" (Batavia, 1835); "Notes on Chinese Grammar" (Batavia, 1842); "Chinese Dialogues" (Shanghai, 1844), &c. In 1838 he published in London an interesting work entitled "China, its State and Prospects," which has been a text book with those taking an interest in missionary enterprises in that part of the world. He is also the author of an "Account of the Malayan Archipelago," "A Glance at the Interior of China," and several minor works.

MEDIA (Old Pers. *Mada*; Heb. *Maday*), an ancient country of Asia, bounded N. by Armenia, from which it was partly separated by the Araxes (Aras) river and the Caspian sea; E. by Hyrcania, Parthia, and the desert of Aria; S. by Persis, S. W. by Susiana, and W. by Assyria and Armenia. It thus corresponded nearly to the modern Persian province of Irak-Ajemees. It formed the westernmost part of the tableland of Iran, being for the most part fertile, and producing wine, figs, and oranges, and an excellent breed of horses, the Nisæan plain, near Rhagæ, being renowned in the times of the Persian dominion as supplying the studs of the great king and his nobles. The most important mountain range in the interior was the Caspian (now Elburz) mountains, the territory between which and the Caspian sea was inhabited by independent tribes; one of the principal rivers was the Amardus, emptying into that sea. Media was well peopled, originally by Turanian Scythæ, who, according to Berosus, seem even to have founded one of the earliest dynasties of Babylon. In the times of Herodotus, and according to his statement, it was occupied by 6 tribes, the Buze, Parataceni, Struchates, Arizanti, Bu-

dii, and Magi, who are said by the Halicarnassian historian and believed by the principal modern critics to have been a kindred race to the Persians, that is, a branch of the great Aryan family. In the time of the Persian power they, or at least a large part of them, spoke the same language as the dominant race, and had the same laws, manners, and religion. On the other hand, there is great difficulty in determining when the supremacy of the Aryan element over the original Turanian or Scythic began, how far the two were blended together, and what relation they occupied to each other during the period of special Median history. According to Otesias, the Medes revolted from the Assyrians and became independent under Arbaces about 875 B. C.; but his whole story about the fall of that empire and the death of its king Sardanapalus is now discredited, as being either entirely fictitious, or at least inaccurate in dates and names. About the same period the Medes first appear in real history, occupying the region S. of the Caspian, when the Assyrian monarch whose expeditions are recorded on the black obelisk in the British museum, made the earliest authentic assault on their independence. Thus also the list of 8 successors to Arbaces on the throne of Media, given by Otesias, can find no credit with critics, especially as his names and dates are entirely at variance with those given by Herodotus. According to the latter, Media, having been for centuries under the sway of the Assyrian monarchs, afforded the first example of a successful revolt to the nations suffering under the same yoke, apparently in the latter half of the 8th century. The people, however, having elected no common chief, suffered greatly from anarchy until a popular judge, Deioceas, secured by stratagem his appointment as ruler of the united state (about 708), by common consent of the Medes, when he also founded a fortified capital, Ecbatana. He was succeeded by his son Phraortes, who, says Herodotus, "not being satisfied with a dominion which did not extend beyond the single people of the Medes," attacked and subdued the Persians, and with the united forces of these two nations engaged in war with the Assyrians, but perished with the greater part of his army, about 638. The authenticity of this Herodotean account of the two first Median reigns is, however, almost unconditionally rejected by the latest critical expounder of the Greek historian, Rawlinson, chiefly on the ground that the time fixed by Herodotus for the Median war of independence can be proved from the monuments to be the same in which Sargon, king of Assyria, made several successful expeditions for the subjugation of Media, which in his palace at Khorsabad also appears as a portion of his dominions. But this evidence against the accuracy of Herodotus's information is greatly invalidated by the testimony of other monuments erected by Sargon's successors Sennacherib and Esarhaddon; and Rawlinson himself acknowledges that "the condition of Media

during this period, like that of the other countries upon the borders of the great Assyrian kingdom, seems one which cannot properly be termed either subjection or independence." It would, therefore, be easy to reconcile the principal facts related by Herodotus, though not his entire account, with monumental history, by supposing his Deioceas and Phraortes to have been either half independent viceroys of the Assyrian monarchs, or rulers in parts of Media which succeeded in conquering and maintaining their independence. But, without subscribing to the opinion of the learned critic concerning the imposition probably practised on Herodotus by his Median informant, who, "desirous of hiding the shame of his native land, purposely took the very date of its subjection, and represented it as that of the foundation of the monarchy," we must admire the ingenuity with which he fixes the Median chronology of his author. (See essay iii., book i.) According to Rawlinson, the Median kingdom was probably first established about 638 by Cyaxares, the third king of Herodotus. At all events, it was probably that monarch, generally regarded by Greeks and Asians as the founder of a dynasty, who made the Aryan element, to which he may have belonged, paramount in the kingdom, after a hard struggle against native and foreign Turanian tribes. The Aryan emigration from the East had for centuries been pressing upon the Turanian populations of the regions E. and S. of the Caspian, and under Cyaxares a violent struggle of the two races was after many years decided in favor of the former. This struggle Herodotus brings in connection with the invasion of Asia by the Cimmerians, relating that the Scythas, their pursuers, interrupted the conquests of the warlike Cyaxares, whose greatest achievement was the conquest of Nineveh in conjunction with Nabopolassar of Babylonia, and spread the terror of their arms as far as the confines of Egypt, holding sway over Asia for 28 years. A treacherous massacre is said to have terminated this sway, when Media, which under Cyaxares also waged a celebrated war against Alyattes of Lydia, became the first among the nations of Asia, another empire being simultaneously founded by its Babylonian ally. "The nature and duration of the struggle with the Scythians, the circumstances of the various wars, and even the order of their occurrence, are points to which no little doubt attaches." Nor can it be absolutely determined "whether the great Median prince began his career from the country about Rhages and the Caspian gates, where the Medes had been settled for two centuries, or led a fresh immigration from the regions further to the eastward." The reign of Astyages, the son of Cyaxares, which lasted 35 years, was peaceful, but ended (about 558) with a catastrophe, which changed the united kingdom of "Media and Persia," as it is called in Scripture, into another styled Persia and Media, in which the people of the con-

queror, Cyrus, became the predominant race. The difficulty, however, which arises from the fact of a Darius Medus being represented in the book of Daniel as king of Babylon, has induced some critics to accept the relation of Xenophon, strengthened by that of Josephus, concerning the reign of a Cyaxares II., son and successor of Astyages, for whom Cyrus, his nephew, conquered Babylon, in preference to the detailed story of Herodotus; while others find Darius the Mede, not in a Cyaxares II., but in Astyages, who may have maintained a shadow of royalty under his grandson Cyrus. Both Media as a province, and its undoubtedly mixed population, continued prominent in the history of the new Aryan empire, though two great struggles for the recovery of independence, under Darius Hystaspes and Darius Nothus, failed. Many of the highest offices in the state were held by Medes; and the Scythic inscriptions on the Persian monuments prove the importance which was attached to the populations of the ancient Median provinces. The relation of the influential caste of the Magi to the Median tribe of the same name, as well as of the Scythic element of the Medo-Persian religion to the Aryan, is not yet satisfactorily cleared up. After the Macedonian conquest and the death of Alexander, a governor of the latter, Atropates, made himself independent in the N. W. part of Media, hence called Atropatene, which continued to exist as a kingdom down to the time of Augustus, while Great Media was under the successive rule of the Seleucids and Parthians. Both parts of ancient Media, the inhabitants of which had long lost their renown as warriors, were again united under the Neo-Persian kings.

MEDICAL JURISPRUDENCE, or the science of legal or forensic medicine, teaches the employment of the principles of medical science in the administration of law. In its relations to jurisprudence, medical learning is a branch of evidence in which the physician or surgeon is called in as an expert. The employment of medical experience in legislation is the proper province of sanitary or medical police, but with that subject the present has no necessary connection. There are traces both in the Jewish and Roman systems of the recognition of medical science in the application of laws; but forensic medicine cannot be said to have attained the dignity of a science until many centuries after the completion of the Justinian code—certainly not until anatomy was studied in the human subject in the 14th century; perhaps not before the publication of the Carolinian criminal code in 1552. The Roman law had referred all medical questions which arose in legal processes to "the authority of the learned Hippocrates." The code of Charles V. enjoined the magistrate, in all cases of doubt respecting asserted pregnancy, infanticide, the means of homicide, and in other cases of death by violence, to consult the opinions of living medical men. During the latter part of the 16th century and

the earlier part of the 17th, legal medicine made marked progress. Ambrose Paré, whom Foderé mentions as the first writer upon the subject in France, published during that time a treatise upon tardy births. Fortunatus Fidelis compiled and published at Palermo in 1602 all that was then known of medical science. At Rome, about 20 years later, Paolo Bacchia, or, as he is usually called, Paulus Bacchias, commenced the publication of his celebrated *Questiones Medico-Legales*. This famous work appeared in successive volumes between the years 1621 and 1650, and for its completeness and great learning deserves the merit of first worthily exhibiting legal medicine as a science. In France in 1609, under a patent of Henry IV., two surgeons were appointed in every considerable town to make examinations and reports in all cases of wounded or murdered persons. During this period the application of the so called hydrostatic test of Galen to cases of supposed infanticide, which had been suggested by Harvey, was discussed in several disquisitions by Bartholin (1668), Swammerdam (1677), Jan Schreyer (1682), and toward the close of the century by the celebrated Bohn, in his treatise *De Renunciations Vulnerum*. In a later work Bohn treated of the office of the physician as expert in judicial tribunals. France produced during this time no very celebrated works on forensic medicine, but the *Doctrine des rapports en chirurgie* of Blégné (1684), and the more useful book of Devaux on the same subject, are honorably mentioned in this branch of the science. In 1722 Valentini contributed to the literature of the science the *Pandectas Medico-Legales*. Between 1725 and 1747 were issued at Halle the successive volumes of the *Systema Jurisprudentiæ Medicæ* of Albertini. Among the more excellent portions of the work, those upon conception and utero-gestation are said to have discussed these topics with great ability. This work was followed by the *Institutiones Medicinæ Legalis vel Forensis* of Tschmeyer. The merit of this work may be inferred from the fact that it was used for a long time as a handbook in the German universities, and formed the text of Haller's celebrated lectures, which were published after his death in 1782 and 1784. The *Elementa* of Plenck (1781) and the *Systema* of Metzger (1795) are commended by writers of high authority. So too is the collection of Metzger's constitutions or opinions, many of which embody the results of his studies in mental disease as a branch of legal medicine. The *Collectio Opusculorum*, edited by Sohlegel, and embracing upward of 40 dissertations by German authors on various topics, was one of the most valuable additions made during the 18th century to the learning of the science. During the latter part of the 18th century, infanticide was made the subject of elaborate research by Daniel and Plouquet, among others, the latter of whom published an essay upon the evidences of respiration in new-born infants; and by Metzger, Portal, and Camper, of whom the last wrote upon the signs of life and birth

in new-born infants, and upon the causes of infanticide. During the same period the eminent French surgeon Antoine Louis, both by private dissertations and by his opinions pronounced before the tribunals, contributed to the illustration of some of the most difficult topics in legal medicine. Among the former are his memoirs upon tardy births, on the certain signs of death, on drowning, and on the mode of distinguishing between suicide and assassination in the case of a body found hanged. But his opinions, many of which are collected in the *Causes célèbres*, present perhaps the clearest evidences of his genius. A valuable memoir upon death from blows or wounds was read by Chaussier at Dijon in 1789, and the next year he delivered there a course of lectures upon legal medicine. Just before the close of the century in 1796 Foderé published *Les lois éclairées par les sciences physiques, ou traité de médecine légale et d'hygiène publique*. This treatise displays the entire system of the science. Dr. Parr published in England in 1788 the "Elements of Medical Jurisprudence." This book was a mere compilation from continental authorities, but was, at the time, the only English work upon the subject. In the first year of the present century, the first lectures in Great Britain upon medical jurisprudence were delivered at Edinburgh by Dr. Andrew Duncan, and in 1806 the first professorship was established in the same city, and conferred upon Dr. Andrew Duncan the younger. The most important accessions to the science of legal medicine during the last 50 years are those derived from studies of mental disease, and the application of the knowledge thus obtained to determining questions of legal responsibility; and from investigations into the nature and effect of poisons, and of the mode of detecting their presence in the human body. The first systematic work of this century is the posthumous one of Dr. Mahon (1807). He was professor of legal medicine at Paris, and occupied one of the chairs which, by the exertions of Ohaussier, Fourcroy, and others, had been established by the revolutionary government. In 1808 Marc published a translation of the German work of Rose on medico-legal dissection, to which he added valuable original notes and essays. Foderé in 1818 issued a second and much enlarged edition of his treatise. Of a far higher character than any work which had preceded it was the *Toxicologie générale* of Orfila, which appeared in 1814, and was followed 5 years later by his *Leçons de médecine légale*. Orfila has rendered the most eminent services to the science, and particularly in the department of toxicology. The elaborate treatise of Devergier made still further advances alike in the theory and practice of legal medicine. Briand, Capuron, Biessy, Esquirol, and Marc are authors of learned treatises or of dissertations on single subjects. But any sketch of the French literature upon this subject would be incomplete without mention of the *Annales d'hygiène et de médecine*, a quarterly journal,

which from its first appearance in 1829 to the present time has been supported by the ablest medical men of France, and is an invaluable repository of information on the various branches of medical jurisprudence. The Germans still maintain their high rank in this science. Schmidtmüller, Willberg, Gmelin, Remer, Bernt, Henke, and many others have made the most various and valuable additions to the learning of medical science and jurisprudence. The principal Italian authors of the present century are Tortosa, Martini, and Barzelotti. In 1818 Dr. Male produced the first respectable English work on forensic medicine. More comprehensive and better in many respects than any which had preceded it, was the treatise of Dr. John Gordon Smith (1821). Two years after appeared the more formal and elaborate work, the result of the combined labors of a lawyer and a physician, Messrs. Paris and Fonblanque. Dr. Christison's works on poisons are of the highest excellence. Haslam on insanity, Hutchinson on infanticide, Watson on homicide, Gavin on feigned diseases, Taylor, Guy, and Traill, are authors of high eminence in their various specialities. Lectures upon medical jurisprudence were first delivered in America in 1804 at Columbia college, by Dr. James S. Stringham. In 1815 Dr. T. Romeyn Beck was appointed to lecture on the science in the western medical college, and not long after Dr. Walter Channing received a similar appointment in Harvard college. American authors have furnished to the literature of medical jurisprudence some of the very best works upon the science. The well-known work of Dr. Beck, which has just reached its 11th edition, has been lately pronounced by Dr. Traill of Edinburgh to be the best book on the general subject in the English language. American editions of various English works, and the publication during the present year of the very excellent treatises of Wharton and Stillé, of a 4th edition of Dr. Ray's celebrated book on insanity, and of Elwell on malpractice, maintain the high reputation of our country in its culture of medical science and jurisprudence. —The very general survey of legal medicine which is here proposed will exclude all notice of medical police or public hygiene, and will be exclusively limited to a brief review of the more prominent branches of the science. Following the division of Briand, the subject may be conveniently arranged under three heads; the first embracing those branches which concern the reproduction of the species; the second considering injuries to health and life, the different forms of death by asphyxia, and the nature and effect of poisons; the third examining mental affections. —In the male, absolute and incurable impotence may arise from total absence, unnatural form, or paralysis of the organs of generation. Curable conditions may be the consequence of disease or sensual excesses, or of slight malformation which can be relieved by surgery. Accidental and temporary incapacity may be caused by nervous or malignant fevers,

particularly if they affect the brain and are accompanied by great debility, all affections of the head and spinal marrow, palsy, apoplexy, and the like diseases. This class of causes usually comes to be considered upon questions of contested paternity; for if it appear that any of these existed at the time of the child's conception, the presumption is strong against its legitimacy. In the female, malformation may render intercourse impossible. If it existed at the solemnization of the marriage and be incurable, it is sufficient ground for divorce. Female impotence may also be caused by diseases which may yield to medical treatment. In two instances familiar to the theory of the common law, though rare perhaps in its administration, medical testimony may be invoked by the courts upon the question of pregnancy: first, where a widow is thought to feign herself pregnant in order to supply a supposititious heir to an estate; and secondly, where a female condemned to death is supposed to be in that condition, for her execution will be delayed if she be quick with child. But in other respects, and particularly in relation to abortion and infanticide, the existence of pregnancy may be a significant fact. In respect to the crimes of abortion and infanticide, and also with reference to civil cases, when questions of heirship are involved, it is important to consider the signs of a child's death before or during delivery. From the sound health of the woman, and the usual signs of a healthy pregnancy, nothing can be conclusively presumed respecting the life of the fœtus; and on the other hand, though violence and those other causes which tend to produce miscarriage may and usually do destroy the fœtus, yet infants sometimes survive all these. The signs of death during pregnancy are numerous, and yet equivocal. Auscultation is one of the surest means of detecting foetal life. After the birth, the physician can judge from the appearance of the body, from the condition of the flesh, from its color, from the condition of the umbilical cord, and of the bones, whether the infant was dead or alive at delivery. The successive stages of foetal life, as they are marked by the size, weight, and development of the organs and functions of the child, should of course be familiar to the physician; they will throw much light upon the matter in question. In its latest researches science has found that the changes in the brain furnish an index of the general development. Yet all inferences derived from the structure and dimensions of the fœtus will be modified and controlled by considering the age and vigor of the mother, her mode of life, and perhaps the climate in which she lives. All systems of law contain provisions respecting newly born infants. To succeed to property, according to the Roman law, the infant must be perfectly alive. The English law makes a like requirement. By the French civil code the child must be viable, or capable of life, in order to be capable of inheriting; and on the authority of the most

eminent surgeons and jurists of France, life, or being born alive, means complete and perfect respiration. The viability of a child, that is, its capacity of life, comes then to be considered in questions of property, and of the division of inheritances; for a child which is declared by medical science to have been viable may be presumed to have lived, and so to have inherited. "It is now very generally conceded," says Beck, "that no infant can be born viable until 150 days, or 5 months, after conception. The instances of exception to this rule are questionable; indeed, the survival of infants born at 6, 7, or even 8 months after conception, is by no means frequent." The criminal destruction of the fœtus while still in the womb, generally described by its consequence as abortion, is more fitly named fœticide. Unlawful attempts to procure birth are variously punishable in the law as felonies or misdemeanors. In England, since the statute 1 Victoria, c. 85, an attempt to procure an abortion with the mother's consent, and before the fœtus has quickened, is declared a felony. Whether in such a case an indictment lay in this country at common law has been variously determined; but statutes have now very generally disposed of the matter, and it is the tendency of later and better legislation, as it is also conformable to the teachings of medical science, to regard quickening of the child as no longer essential to the criminality of an unlawful abortion. The duty of the medical expert in cases of supposed fœticide (for in a medico-legal point of view that is the proper term) is to determine whether the substance expelled from the womb be really the product of conception; whether this was the germ of a human being; and also whether the causes of miscarriage were natural or artificial.—Infanticide is the murder of a child born alive. Here the medical examiner must address his inquiries first to the appearance of the body in order to determine whether it was born alive. If that be clear, he will seek to determine how long it lived, and the means by which it came to its death. These inquiries will naturally involve an examination of the female alleged to be the mother. Proof that life has existed in the child may be derived from the effects of respiration upon some of the organs of the body. In a child which has breathed completely and fully, the thorax will be found expanded and the diaphragm more or less depressed by the inflation of the lungs. These signs alone are not, however, of much value. Respiration will also have distended the lungs, and increased their volume, and will have changed their color from the brownish tint of the foetal lungs to a pale red or scarlet color. After respiration the lungs become soft and spongy, and they crepitate more or less upon pressure. The hydrostatic test is often applied. Galen had taught that by inspiration the lungs are rendered specifically lighter, and in modern times the test was first applied by Schreyer in 1682 to cases of suspected child

murder. In the course of experiments it has been found that the lungs may float from other causes than respiration, as for example from putrefaction, or the artificial introduction of air. But, observing certain precautions, it may be certainly known to what cause the buoyancy is due. If, says Beck, with such precautions it be found that the lungs float in the water, as well with the heart attached to it as separate from them; if when cut into pieces each fragment floats, then the proof is strong that the infant enjoyed perfect respiration. Something may also be concluded, though not with much certainty, from the character of the blood found in the body, but more from the changes in the blood-circulating organs which are known to be wrought by the establishment of respiration, as, for instance, in some of the vessels and ducts of the heart, and in the arteries and veins of the umbilical cord. The separation of this cord, in the living child, is preceded by several stages of desiccation; and if this characteristic be present, its condition will afford evidence of the infant's age. To the validity of these indicia, so far as they tend to show the fact of life, it has been objected that the child may have breathed during delivery, and yet have died before it was fully born. It is replied to this, that the fact of breathing during birth affords the best presumptive evidence that the infant was born alive, and that the marks of any accidental cause of death will generally be discovered on inspection. More than that, respiration in such cases is commonly imperfect, and the objection will therefore have but little weight where the body presents the appearances which are induced by complete respiration.—If the examination lead to the conclusion that the child was born alive, the means of death must next be determined, and whether they were innocent or criminal. The omission to tie the umbilical cord, permitting fatal hæmorrhage by its severed vessels, may be a cause of death. In such a case the body presents externally a singular paleness, and a peculiar waxy appearance. Internally is observed a loss of color in the muscles and viscera, and absence of the usual quantity of blood in the heart and blood vessels. Exposure to cold immediately after birth, want of proper nourishment, the infliction of blows and wounds, the thrusting sharp instruments into various parts of the body, are frequent modes of child murder. In cases of strangulation, suffocation, and poisoning, the indications of the cause of death are evident, and are suggested under the proper divisions of this article. It must be remembered also that accidental causes attendant upon birth, congenital disease, malformations or defects of internal structure, may deprive the child of life or render it incapable of living. The mother may have been overtaken by the pains of labor when alone and unassisted, and then there are many chances against the safe delivery of the infant. Fainting or convulsions, which sometimes attend labor, may render her incapable of ministering

to the first wants of her child; unskilful and imperfect ligature of the umbilical cord may produce death. An examination of the supposed mother has already been suggested.—In determining questions of legitimacy, the consideration of premature and tardy births necessarily arises. The ordinary period of gestation, derived from accurate data, is fixed at 10 lunar months, or 280 days. It is admitted on high authority that this time may be exceeded, but it has been suggested that the apparently exceptional cases may be explained by the fact of inaccurate computation. Still it is to be remembered that the human fetus is ordinarily expelled only when it has attained sufficient development, and that, as this may be delayed by disease or other causes, it is not strange that delivery may be for a longer or shorter time deferred. Whether a child born before the time expected is to be regarded as legitimate, has been already incidentally discussed. It has been seen that the best authorities deny that a perfectly natural child can be born in less than 7 months after conception. The absence or incapacity of the husband during this period, and all other causes which render intercourse impossible, tend strongly to prove illegitimacy of the child. Births occurring at 18 and even 14 months after an alleged coition have been sometimes claimed to be legitimate. This topic of protracted gestation has been abundantly discussed by medical writers. It must suffice here to say that, though the theory seems to be well opposed by many, it is yet favored by a majority of the authorities, among whom are included Bacchias, Haller, Petit, Foderé, Capuron, Orfila, and others of almost equal eminence. It may be added that, of the cases cited in support of this theory, the best authenticated are those in which the ordinary period of gestation was exceeded only by 8 or 4 months. But in a case of questioned legitimacy this eccentricity of nature is too marked to allow a too ready admission of its probability.—When a person is found dead under circumstances which render the cause of death doubtful, the medical expert may be called upon for an opinion whether death resulted from natural causes, or had been produced by violence; and, if by violence, whether that was self-inflicted or proceeded from the hands of an assassin. Under this division of our subject we propose to notice some of the more usual and characteristic phenomena observed in cases of death by blows and wounds; by asphyxia, considering here drowning, hanging, and suffocation; and finally, by poisons. The appearances in the body which are caused by effusions of blood, will attract the early attention of the examiner. He will determine whether these are in the nature of ecchymosis or of sugillation. When a blow or contusion is sufficiently violent to rupture blood vessels, the effused blood spreads into the cellular tissues and forms ecchymosis. The intensity and graduation of color in these spots give clear indications of their cause, and the freedom of the hæmor-

rhage shows that they were produced during life. Ecchymosis is named traumatic when, as is usually the case, it proceeds from external causes, and spontaneous when it is the effect of internal violence. From this must be distinguished the post-mortem appearances caused by sugillation. This is the term applied to the determination of the blood, merely as an effect of gravitation, into the lower lying portions of the dead body, and into the capillary, and not into the cellular tissues. Ecchymosis may be imitated on the dead body within a short time after life is extinct; but very violent blows, inflicted then, will produce only the same effect as slight contusions during life. The body may plainly show, or dissection may disclose, that death was caused by wounds, that is to say, in the language of legal medicine, by a lesion of any part of the body. It may be remarked in passing, that, in law, a wound means a breaking of the skin, at least, by the application of extreme violence. A division of the cuticle alone is not sufficient. The true skin must be penetrated, though there be no effusion of blood. In surgery, a wound means a solution of continuity in the fleshy parts. The first inquiries of course will be whether the wounds discovered were self-inflicted, or resulted from accident, or were given by a homicide. The position and direction of the injuries will be noted. The presence of many wounds argues violence by another hand than that of the deceased. The suicide generally directs the hurt to a single vital point. A wound made by a cylindrical and pointed instrument has distinct angles. A cut is larger than the cutting edge, and in the living body is always accompanied by some effusion of blood. A wound by a perforating instrument is generally smaller than the instrument which inflicted it. The entrance made by a ball is distinguished by the regular roundness and depression of its edges; the exit wound is torn and ragged. The former is also larger than the latter. The spiral direction given by the rifle ball causes a more ragged wound than that produced by a ball from a smooth-bored arm. A single round wound can be produced by a shot charge only when it is fired at a distance of 10 or 12 inches, and then the injury is not the same as that of a ball, but is more extensive and more serious. The examination of spots supposed to be made by blood may lead to important discoveries. Blood washed from linen into water imparts to it a deep red color; boiling produces a muddy brown precipitate which is to be subjected to chemical tests. In fresh blood the microscope reveals the presence of red flattened disks, which are the blood disks, and among these, more rarely, the rounded colorless lymph globules. These latter may still be observed under the microscope in the water in which dried blood has been softened; the blood disks are less easily obtained. It is often a question for the medical expert, when disease has succeeded to the injury, whether death re-

sulted from the one cause or the other. If malignant or inflammatory symptoms follow upon slight wounds, the inference is ordinarily not difficult that the injury was not the cause of death. The habitual use of intoxicating liquors tends to induce a diseased condition of the system, and in a state of actual drunkenness the vessels of the body are in that condition in which an external injury is apt to produce rupture, and a less violent blow will cause it than would otherwise be required. Legal responsibility rests on the clear and direct consequence of the injury inflicted. This principle must always be borne in mind. For disease, though developed in organs far from the seat of the wound, may yet be its immediate result; as, for example, injuries of the head may promote a deposition of pus in the lungs, or give rise to abscesses of the liver; and on the other hand, death may result from improper medical treatment, or from the negligence or excesses of the injured party himself. (For the subject of malpractice, see PHYSICIAN.) Though external marks fail, the skilful anatomist may discover upon dissection internal signs of mortal injuries. Blows or wounds upon the surface of the body may possibly rupture the heart. Ruptures of aneurisms may be produced by the excitement of passion, and laceration of the spleen or liver by a fall or other sudden external violence. Death from starvation is characterized by distinctive phenomena. The body is extremely emaciated, and, even though death were recent, exhales an acrid and fetid odor; the eyes are red and open, the tongue and throat dry, and the stomach and intestines empty; the blood vessels are quite empty, and the intestines inflamed and ulcerated.—When life has been destroyed by the inhalation of noxious vapors, as for instance of carbonic acid or sulphuretted hydrogen gas, the head and face are found to be swollen, the eyes protruded, and the tongue fixed between the teeth. The face, if observed soon after death, may be pale, but generally soon becomes livid. The blood vessels of the head and lungs and the right vessels of the heart are filled with dark fluid blood. Pure carbonic acid gas is irrespirable, and inhalation of it causes death rather by asphyxia than by poisoning. When mixed with oxygen, 10 per cent. of this gas is very promptly fatal to life, and even a smaller proportion may produce the same result. Death from asphyxia is caused in various ways. When respiration is checked by mechanical compression of the organs which perform that function, or when it ceases either from want of air, as in cases of suffocation and strangulation, or from failure of vital air, and the inspiration of mephitic or deleterious gases, death is caused by asphyxia. Properly speaking, death ensues in those cases from non-aëration of the blood. It is preceded and accompanied by marked phenomena, more marked and evident in proportion to the rapidity with which death advances. In a violent struggle for breath, the eyes become distended, the veins

swollen, and the face is fully suffused. On dissection, the pulmonary vessels and the right auricle and ventricle of the heart are found charged with blood, the liver, spleen, and kidneys are gorged, and the lungs expanded. In cases of less violent death, where, for example, it is brought about by inhalation of noxious gases, these appearances are less strongly marked.—Hanging sometimes causes death, by producing congestive apoplexy, the pressure of the cord preventing the return of blood from the brain, while it does not check the circulation by the intervertebrals; but more frequently the destruction of life is due to asphyxia. Luxation or fracture of the cervical vertebrae speedily causes death. The signs of strangulation are a livid depressed circle upon the neck, made by the cord; the face is distorted; the eyes are open and protruded; the face, shoulders, and chest swollen. The ecchymosis produced by the cord is an important sign, for, as has been already observed, ecchymosis is possible only when contusion of the tissues takes place in the living body; yet in inferring the mode of death it is to be remembered that as death in hanging may suddenly result from luxation, the cord may have had no time to act on living tissues. The condition of the genital organs also affords very important proof of death by hanging. The color of the countenance is also to be regarded. If the trachea or larynx was alone compressed, the face is pale; but when the veins of the neck were pressed, as by the cord, and the heart continues for some time its action, the blood is propelled into the head and causes suffusion of the face.—The question may arise whether, if the deceased came to his death by hanging, that were his own work, or the work of a homicide. An examination of cases of suicide has shown in a large proportion of them the absence of ecchymosis; and this because from the employment of less violence the contusion of the neck was less. Fracture of the vertebrae of the neck is often caused in execution by the fall of the body, or even by force which is sometimes applied by the hangman. But luxation is of course not conclusive evidence of homicide. An examination of the position of the body and of the objects which surround it, of its elevation above any possible support, and any marks which show resistance, must be made in all suspected cases. In strangulation, in its ordinary sense, death results not from fracture of the vertebrae, but from interruption of respiration. This is a rare mode of suicide, and when appearances indicate that it was the means of death they raise a violent presumption of assassination. Because death ensues from interruption of the breath, the mark of the cord must be quite distinct, and is rather horizontal than oblique. Bruises of peculiar form around the neck may show that strangulation was effected by the hands. It is impossible that these should have been made by the suicide, because the hands lose their power as insensibility progresses. In cases of hysteria, apoplexy, or epilepsy,

the sufferer may, however, in his agony have pressed the hands to the throat, and in this way have made the marks which give rise to a suspicion of murder.—Obvious and distinctive marks are, says Dr. Christison, rarely present in a case of death by suffocation. They are the less evident as death is the more rapidly induced; for if there be no time for the accumulation of blood in the venous system, there will be no enlargement of the pulmonary vessels, no turgescence of the veins, and no discoloration of the skin. In the cases which occurred in the Champ de Mars in Paris in 1837, of suffocation by pressure in the crowd, when death was probably caused by respiration being incomplete, and was long deferred, the bodies of the dead exhibited peculiar appearances. Their faces and necks were of a uniform violet tint, spotted with blackish ecchymosis, and in some instances blood and froth oozed from the mouth and nostrils.—As in hanging, so in drowning, life is destroyed by different modes, sometimes by suffocation, or rather by the asphyxia which that causes. This is the most usual form of death by drowning. Another form is that of syncope asphyxia. In these cases, the coldness of the water, or perhaps intoxication, throws the system into a condition of nervous inaction, and the body presents only the appearance of simple asphyxia, paleness of the body, no froth in the trachea or bronchi, and but slight disturbance of the internal organs. Still another cause of death is apoplexy from cerebral congestion. A drowned body usually presents general paleness of the skin, yet the face will be discolored if death were preceded by long-continued struggling. It is to be remarked that upon exposure of the body to the air, discoloration very speedily ensues. The eyes may be found half open, attended by dilatation of the pupils. These signs, as also frothing at the mouth, may proceed from other violent means, but still are strong proof of drowning. Of the internal appearances of the body may be mentioned a fulness in greater or less degree of the blood vessels of the head and of the right side of the heart. The congested condition of the brain varies with the proximate cause of death. If that were apoplexy, it would certainly be present, but rarely or not at all in the case of syncope asphyxia. The blood of the drowned is generally found fluid. The existence of froth in the bronchi is perhaps not a conclusive proof of the mode of death; but it is certainly the result of vital action, and so may be a valuable sign in conjunction with others to prove that life existed when the body was immersed. The presence of water in the stomach is merely accidental, and is not very nearly connected with the cause of death. As upon high authority it is asserted that water cannot pass into the stomach after death, its presence in it may be in certain instances significant. When death arises from obstruction of the breath by water, and not by apoplexy, some of the fluid enters into the lungs with the last efforts of inspiration.

Yet neither the fact that it is found there, nor its quantity, can be regarded as proving conclusively that death took place in consequence of immersion; for under favorable circumstances water may penetrate into the lungs even of a dead body.—Foderé defines poisons as those substances which are known by physicians to be capable of altering or destroying, in a majority of cases, some or all of the functions necessary to human life. The intent with which such a substance is administered enters of course into the legal conception of a poison. Poisons may be ranked under the two great divisions of irritant and narcotic. To irritant poisons belong the acids and their bases, the alkalies and their salts, the metallic compounds, and the vegetable, animal, and mechanical irritants. The characteristic of these poisons is the inflammation which their application excites. Their most notable effects upon the human body are heat, irritation, or singular dryness in the œsophagus, accompanied by a sensation of strangling; pain in the stomach and intestines or in the region of the kidneys, followed by strangury; evacuations both by vomiting and at stool, convulsions, faintings, cold sweats, and an irregular thready pulse. There is, usually, a retention of the intellectual faculties until the disease approaches a fatal termination. Narcotic poisons, on the other hand, which include many vegetable substances, prussic acid and its compounds, and the narcotic gases, nitrogen, carbonic acid and oxides, oxygen, hydrogen, and others, are distinguished by the disorders which they produce in the nervous system. They are defined by Orfila to be those which cause stupor, drowsiness, paralysis, or apoplexy and convulsions. Among their usual effects, in the various stages of their influence upon the body, may be mentioned numbness, coma, and sometimes delirium, cold and fetid perspiration, swelling of the neck, face, and sometimes of the whole body, dilatation of the veins, protrusion of the eyes, general prostration, chilliness and paralysis of the extremities, and, just preceding death in some instances, pain and convulsions. The narcotic-acrid poisons produce combinations of several of these symptoms. The effects of poisons differ widely in different persons, and are more or less distinctly marked according to the form, whether solid or liquid, in which the poisonous substance is administered. The symptoms are naturally varied too by the condition of the system, particularly of the stomach, when the poison is taken. It may be added here that the effects of poisons may be closely imitated by certain diseases, as, for example, by cholera. Rupture of various intestines, of the stomach, the duodenum, or the uterus may produce symptoms similar to those of irritant poisons. In seeking for the evidences of poison in a dead body, the first inquiry is as to the nature of the substance taken. It is a distinctive feature of the irritant poisons that they excite inflammation, in greater or less degree, in every part to which they are applied, and internally corrosions or perforations where

the poisonous matter rests longest. The inflammation varies in extent and intensity. It is usually observed in the mouth, throat, and stomach, but may reach through the whole length of the digestive tube. The membranes are of various degrees of redness, sometimes accompanied by dark patches of extravasated blood, and sometimes also by ulceration. The traces of narcotic poisons are not so evident. Dr. Christison says even that the marked appearances which they leave are insignificant. Certainly, it is not characteristic of this class of poisons, as is often supposed, that they induce putrefaction, or that the blood remains fluid. Often, however, the veins of the head are found gorged with blood, the lungs bear black and livid spots, and their texture is less dense. These same changes, both in the brain and in the nature of the blood, are produced by the narcotic-acrid poisons. For the purpose of charging innocent persons with murder, poisons have been in some instances injected after death. Orfila instituted experiments in this matter, and found that he could not reproduce in the dead body the appearances manifested by the living tissues. In the latter case, inflammation in graduated stages of intensity always attends the injury. But in his experiments there was always a perfectly defined line of demarcation between the points to which the poison was applied and those adjacent. In examination of the stomach, it is to be remembered that the vascularity or redness of this organ may arise as well from natural causes as from the influence of poisons. This appearance occurs, says an eminent author, in every variety of degree and character, under every circumstance of previous indisposition, and in situations where the most healthy aspect of the organ might be fairly inferred. Nor are marks of poisons to be confounded with those discolorations which may be produced by the liver and spleen. Ulcers and perforations have sometimes been wrongly attributed to the effects of poison. What is called the digestion of the stomach has often been mistaken for poison. In this condition of the organ its coats are rendered thinner and transparent, and sometimes the destruction of them advances even to perforation. These must be distinguished from those which are caused by corrosive poisons. The latter have clearly defined edges, and thick as the thickness of the coats which are pierced. These margins, too, are usually of a peculiar color, according to the poison employed; for example, yellow with nitric acid, brown or black with sulphuric acid and the alkalies, and orange with iodine. Finally, in a case of spontaneous erosion, there is generally a remarkable whiteness of the inner wall of the stomach; but in a case of poisoning there must be unequivocal signs of inflammation or of irritation.—In reference to the application of chemical tests, it may be remarked that poisons may be absorbed or decomposed, and in such cases it may be found by boiling the stomach and intestines, and subjecting the fluid to proper tests. Poisons which re-

main in the dead body may be affected by the chemical changes involved. By the ammonia disengaged during decay acids may be neutralized; and by the action of the animal matter the mineral salts may be decomposed. Soluble poisons, as oxalic acid, disappear; arsenic, opium, cantharides, and strychnia are not essentially changed. Our limits will not permit us to give the particular and specific evidence or indications of the action of different poisons; nor even to enumerate all those which have been considered in medico-legal practice, and are treated of in the various works on medical jurisprudence to which we have already referred. Nor can we indeed even enumerate all of these. But among the most important of the irritant class, or usually arranged in this class, are arsenic, the salts of mercury, lead, copper, and some other metals; sulphuric, nitric, oxalic, and some other acids. Of the narcotic class may be mentioned opium, prussic acid, strychnia, and the oils of cedar, tanzy, and savin; but some of this class also cause nervous irritation.—Insanity, in all its forms, is an important topic of medical jurisprudence. (See LUNACY.)

MEDICI, a distinguished family of Florence, Italy. From an early period of Florentine history the Medici were conspicuous in the service of the republic. In 1351 Giovanni de' Medici, at the head of only 100 men, relieved the fortress of Scarperia by forcing his way through a Milanese army which was then besieging the place. A few years later Salvestro de' Medici acquired great reputation by his firm resistance to the tyranny of the nobles. In 1379 he was chosen chief magistrate, and effected important reforms in the government in spite of the commotions raised against him by the nobility. His son Veri held also a high rank in the state, and was very popular with the common people. The family were largely engaged in commerce, in which they had accumulated great wealth. The most successful merchant of them all was a second Giovanni de' Medici, who, after serving for many years as a member of the seignory and of the council of ten, was chosen, in Sept. and Oct. 1421, gonfaloniere, or chief magistrate, the term of the office being then two months. He died in 1428, leaving an immense estate to his two sons, Cosmo and Lorenzo.—Cosmo, or Cosimo, called THE GREAT, was born in 1389, and even in the lifetime of his father he had been deeply engaged in commerce, and had filled offices of state, having attained to a seat in the seignory in 1416. The death of his father made him the head of the family, and he soon became the leading man in the state, exercising a prodigious influence by his personal popularity, prudence, urbanity, and unbounded generosity. His power and that of his immediate descendants was of a very peculiar nature; it consisted in a sort of tacit influence voluntarily acquiesced in by the people, and not in any definite authority. The government of the republic continued to be directed by a council of ten and a gonfaloniere elected every two months. But the Medici

generally either assumed to themselves these offices, or nominated their friends and partisans to them, paying at the same time great deference to popular opinion, and, content with substantially controlling the state, avoiding all offensive display of power. Cosmo, however, in spite of his prudence and moderation, was at the outset opposed by a powerful party, headed by the Albizzi family; and in 1438 Rinaldo de' Albizzi carried the elections against him, and procured a decree banishing Cosmo for 10 years and his brother Lorenzo for 5 years. At the end of a year the party of the Medici again prevailed in Florence, repealed the sentence of banishment, and sent Rinaldo and his principal adherents into exile. The rest of Cosmo's life was passed in prosperity, and in the promotion of letters and arts, and the management of the foreign affairs of the republic. He continued to the last engaged in commerce, which he carried on by means of agents. His mercantile transactions seem to have been chiefly with the East through Alexandria, where an immensely lucrative trade existed in oriental productions, prior to the passage of the Portuguese around the cape of Good Hope. The banking houses which the Medici maintained by agents in the chief cities of Europe were also the source of vast profits; and a considerable revenue was drawn from their numerous farms and mines, especially the mines of alum, of which they had nearly the monopoly in Italy. Cosmo himself lived in a simple style, but spent vast sums of his own money in adorning the city with splendid public edifices. His wealth and influence ranked him with the most powerful princes of Italy, any of whom would have been glad to ally themselves by marriage with his family; but as such connections would have given rise among the Florentine people to unfavorable suspicions of his designs, he selected wives for his sons among the aristocracy of his native city—Piero, the eldest, marrying Lucretia Tornabuoni, while Giovanni, the youngest, espoused Cornelia de' Alessandri. Cosmo died Aug. 1, 1464. By a public decree shortly before his death he was honored with the title of *pater patriæ*, and the appellation was inscribed on his tomb. His son Giovanni died before him.—PIERO, who succeeded Cosmo, was in such ill health as to be almost constantly confined to his bed. He was less popular than his father, and a powerful party, headed by Luca Pitti, the builder of the famous Pitti palace, and by other powerful nobles, was soon formed against him. Failing, however, to overthrow the Medici by peaceful measures, they attempted in 1466 to assassinate Piero, but their plot for this purpose was baffled by the vigilance of his son Lorenzo. The failure of this conspiracy strengthened the Medici, and their principal opponents were banished, with the exception of Pitti, who abandoned his own party and suddenly went over to that of the Medici, who now became the almost undisputed masters of the state. Piero died Dec. 8, 1469.

He was inferior in talent to his father Cosmo, but had conducted with skill and credit several important negotiations during his father's lifetime, and his subsequent direction of the affairs of state was marked by prudence and solidity of judgment. He was a munificent patron of letters and arts. "It is probable," says Tiraboschi, "that had Piero enjoyed better health and longer life, he might have done more for the interests of literature; but if he had only been known as the father of Lorenzo de' Medici, it would have been a sufficient title to the gratitude of posterity." Piero left two sons, Lorenzo and Giuliano.—LORENZO, surnamed THE MAGNIFICENT, was born Jan. 1, 1448. At an early age he gave striking indications of extraordinary talent, and the munificent disposition which afterward gave him a claim to the appellation of Magnificent was apparent in his childhood. He had rendered himself conspicuous before he arrived at manhood by his poetical talents, and by his penetration, courage, and good sense. He was tall and robust, with a dignified countenance and pleasing manners, but labored under some peculiar disadvantages. His sight was weak, his voice harsh, and he was totally devoid of the sense of smell. He received the first rudiments of education from Gentile d'Urbino, afterward bishop of Arezzo. In 1457 Christoforo Landino, an eminent professor of poetry and rhetoric, became his teacher; while in the Greek language, and in the philosophy of Aristotle, he was instructed by the learned Argyropolus, and in Platonism by Marsilio Ficino, for whom he contracted a friendship that lasted through life. When his domestic education was completed he visited the various courts of Italy, and his correspondence with his father during his absence shows that the latter had already learned to repose great confidence in the discretion and judgment of his son in political matters of the highest consequence. The share taken by Lorenzo in defeating the conspiracy headed by Luca Pitti, and the lenity and magnanimity with which he treated the conspirators, extended his reputation throughout Italy. On June 4, 1469, he was married to Clarice Orsini, of the noble and powerful Roman family of that name. Their nuptials were celebrated with splendid exhibitions of military spectacles and other pageants. On the day after the death of his father in the same year, Lorenzo was waited upon by many of the principal inhabitants of Florence, who requested that he would take upon himself the administration and care of the republic in the same manner as his father and grandfather had before done. In 1471 he was sent to Rome at the head of a magnificent embassy to congratulate Sixtus IV. on his elevation to the papacy. The pope on this occasion formally invested him with the office of treasurer of the holy see. The friendship of Sixtus, however, was not of long continuance. He undertook in 1474 the conquest of the city of Castello, against which place he sent an army. As Castello bordered the territory of Florence, and

its ruler Niccolo Vitelle was a personal friend of Lorenzo, Florence lent some assistance to its defence, which, though ultimately unsuccessful, was so vigorous and protracted as to cause the pope great expense and vexation, which he attributed chiefly to Lorenzo, against whom he conceived a violent hatred. An additional motive of resentment was found in the fact that Lorenzo had lately effected an alliance between Florence, Venice, and Milan, for the purpose of checking the ambitious projects of the pope and protecting the independence of the minor states of Italy. Regarding the Medici as the chief obstacle to his aggrandizement, Sixtus zealously strove to destroy their power, and he is even accused by many historians of having instigated a conspiracy for the assassination of Lorenzo and his brother Giuliano. Into this plot entered the cardinal Riario, the archbishop of Pisa, several priests, and Francesco and Giacompo de' Pazzi, of a noble Florentine family hostile to the Medici. The attempt was made during divine service in the church of the Reparata, on Sunday, April 26. The signal agreed upon was the elevation of the host, at which moment Francesco de' Pazzi and another conspirator named Bordini stabbed Giuliano, and instantly killed him. Two priests at the same instant attacked Lorenzo, but only succeeded in giving him a slight wound in the neck. He defended himself with vigor, and was presently surrounded by his friends, who escorted him home after putting to death all the conspirators within reach except a few who were saved by the generous interposition of Lorenzo himself. Meantime an unsuccessful attempt had been made to seize the government palace by the archbishop of Pisa, who was taken prisoner by the magistrates, and summarily hanged from its windows, together with Francesco and several others of the Pazzi, of which family the only one who escaped the popular fury received shelter in the house of Lorenzo. Bordini, the murderer of Giuliano, escaped from the city and from Italy, and took refuge in Constantinople; but the sultan ordered him to be seized and sent in chains to Florence, because, as he declared, of the respect which he had for the character of Lorenzo de' Medici. The ill success of this flagitious conspiracy did not mitigate the wrath of Sixtus against the Medici, and he forthwith issued a bull excommunicating Lorenzo and the magistrates, and suspending the entire Florentine clergy from their functions on account of the execution of the archbishop of Pisa. He also, in conjunction with the king of Naples, made open war upon the republic, offering, however, to conclude peace upon the condition that Lorenzo should be banished from Florence, or delivered into their hands. As the resources of Florence were inadequate to long maintain a contest with two such powerful enemies, Lorenzo, perceiving that the war was waged against him personally, took the extraordinary resolution of proceeding to Naples and putting himself in the king's power. He accordingly went thither, and was received with great distinction.

His personal influence had such an effect upon the king of Naples, that, in spite of the utmost efforts of the pope, Lorenzo in the course of three months converted him from an enemy to a warm friend, and returned to Florence, bringing with him a treaty of peace and alliance with Naples. Peace with the pope followed soon after. Lorenzo now began to take measures for securing the peace of Italy by establishing a balance of power in the peninsula, of which Florence was to be the political centre. He also proposed and persuaded the people to agree to the institution of a permanent senate, nominated by himself, to govern the republic instead of the democratic councils to whom the supreme power had been previously intrusted. A second attempt to assassinate him was made in the church of the Carmeli, May 31, 1481. The assassins were seized before they could execute their purpose, but the attempt furnished Lorenzo with a convenient excuse for surrounding himself with a body guard. His inveterate enemy Sixtus IV. died in 1485, and was succeeded by Innocent VIII., who was friendly to Lorenzo, and in a short time made the Florentine his most intimate confidant, and thus opened to the Medici the dignities and emoluments of the church by which the family afterward so much profited. The alliance of the pontiff augmented still more the influence of Lorenzo upon the affairs of Italy, which was now in a more prosperous condition than it had been for 1,000 years past, while Florence itself had reached the highest pitch of power and opulence to which it ever attained. "This extraordinary felicity of Italy," says the historian Guicciardini, "several circumstances contributed to preserve; but among the rest, no small share of it was by general consent ascribed to the industry and the virtue of Lorenzo de' Medici; a citizen who rose so far beyond the mediocrity of a private station, that he regulated by his counsels the affairs of Florence, then more important by its situation, by the genius of its inhabitants, and the promptitude of its resources, than by the extent of its dominions; and who, having attained the implicit confidence of the Roman pontiff, rendered his name great and his authority important throughout Italy." Lorenzo's attention to public affairs had obliged him to neglect his own, and he became so involved by expenditures for political purposes that in 1490 the republic granted him a sum to pay his debts, of so large an amount that Hallam says she "disgracefully screened the bankruptcy of the Medici by her own." At this time he abandoned commerce, which his family had pursued for so many generations. In the beginning of 1492 he was attacked by a strange species of fever which baffled the skill of the physicians, and of which he died on April 8. He left three sons, of whom Piero, the eldest, was born Feb. 15, 1471; Giovanni, the second, who had been made a cardinal at the age of 13, and became afterward pope under the title of Leo X., was born Dec. 11, 1475; and Giuliano, the youngest, who became duke of Nemours, was

born in 1478. Lorenzo was eminent not only as a statesman, but as a poet and scholar. Among his most intimate friends were the poets Politiano and Pulci. He was a munificent patron of authors and artists, and spent vast sums in erecting public edifices and in establishing schools and libraries. He reestablished the university of Pisa, and greatly enlarged the famous Laurentian library at Florence, which derives its name from him, and which was founded by his grandfather Cosmo. See Roscoe's "Life of Lorenzo de' Medici" (2 vols. 4to., London, 1798), the 10th and best edition of which forms a volume of Bohn's "Standard Library" (London, 1851).—PIERO DE' MEDICI, the successor of Lorenzo, had much of the talent without the prudence of his father. His ambition and temerity involved Florence in war with Charles VIII. of France, and led to his own expulsion from the city in 1494, and to the occupation of Florence by the French army shortly afterward. After an exile of 10 years, during which he made repeated though futile attempts to regain his authority in Florence, he entered the service of France, and was present at the great defeat of the French army by Gonsalvo de Cordova on the banks of the Garigliano, in which river he was drowned while endeavoring to escape from the pursuit of the Spaniards. By his death his second brother, Cardinal de' Medici, became the head of the family. In 1512, partly by policy, partly by force, he effected the restoration of the Medici to Florence, and shortly afterward, March 11, 1513, was himself elected pope. (See *Leo X.*, vol. x. p. 456.) He intrusted the direction of Florentine affairs to his younger brother GIULIANO, who, having more taste and capacity for literature than for politics, soon resigned his authority into the hands of his nephew Lorenzo, the son of the Piero who fell at Garigliano, and retiring to Rome became commander-in-chief of the papal troops. Having married Filiberta of Savoy, a descendant of the house of Bourbon, he was made duke of Nemours by Francis I. of France. He died at Florence in March, 1516. He left a natural son, IPPOLITO, who became a cardinal with an immense revenue, which enabled him, without territories and without subjects, to maintain at Bologna a court far more splendid than that of any Italian potentate. He was, says Roscoe, "at once the patron, the companion, and the rival of all the poets, the musicians, and the wits of his time. His associates and attendants, all of whom could boast of some peculiar merit or distinction which had entitled them to his notice, generally formed a body of 800 persons." He died while yet young from poison administered by one of his domestics.—LORENZO II., after the resignation of Giuliano, governed Florence for some time under the orders of Leo X. He made himself by force of arms duke of Urbino in 1516, and in 1518 married Magdeleine de Boulogne, of the royal house of France. He died in the following year, a few days after the birth of his famous daughter Catharine de' Medici, afterward queen of France. Prior

to his marriage the duke of Urbino had an illegitimate son named ALESSANDRO, whose mother was an African slave. The paternity of Alessandro has also been attributed to Pope Clement VII., who was himself an illegitimate son of Giuliano, the brother of Lorenzo the Magnificent. It is certain that Alessandro was in high favor with the pontiff, who, on the death of Lorenzo II. without a legitimate male heir, and the consequent failure of the descendants of Cosmo the Great, brought him forward in order to prevent the power of the family from passing into the hands of a collateral branch descended from a brother of Cosmo. He accordingly availed himself of the dissensions of the Florentines, and in 1532, with the assistance of the emperor and the king of France, he compelled the republic to receive Alessandro as its ruler, with the title of duke. He proved, however, to be a licentious tyrant, and was assassinated in 1566 by Lorenzino, a member of the collateral branch of the family. The citizens assembled on this event, and invested Cosmo DE' MEDICI, the cousin of Lorenzino, with the sovereignty under the title of the chief of the republic, which he afterward exchanged for that of grand duke. He became the progenitor of a line of grand dukes, 6 in number, who ruled Tuscany till 1787, when the main line of the Medici family became extinct.

MEDICI, CATHERINE DE'. See CATHERINE DE' MEDICI.

MEDICI, MARIA DE'. See MARIA DE' MEDICI.

MEDICINE, the art and science of curing disease. The practice of medicine must have everywhere arisen from the accidents and infirmities to which mankind are liable. Some rude appliances to wounds and injuries, some equally rude observances in cases of internal disease, are common among the most barbarous people. The idea that disease is caused by the anger of superior and invisible beings placed its treatment in the hands of the priests, and the same idea caused that treatment to consist mainly of superstitious rites. In what beyond this consisted the medicine of the Egyptians, the Hindoos, &c., is a matter of conjecture only. In Greece as elsewhere the early history of medicine is involved in darkness, and it is idle to guess how much truth is contained in the fables concerning Chiron and his pupil Æsculapius, or the sons of the latter, the Homeric heroes Machaon and Podalirius. We know, however, that the temples of Æsculapius were from an early period the resort of the sick, who submitted themselves to the regulations of the Asclepiads, the priests of the temples, and that these priests must have thus had large opportunities for the study of disease. It was common among those who were cured to deposit in the temple a votive tablet, on which was inscribed some account of the case and of the remedies by which it was relieved; but if the tablets which have come down to us are fair samples, but little information could have been communicated in this way. Much more must have been due to the education in the temple, to personal observation,

and to the restless and inquiring spirit which animated the early Greeks. But the temples of Æsculapius are not the only source to which the origin of scientific medicine is to be traced; in the schools of philosophy some attention was always paid to the healing art as a branch of general education. When the school of Pythagoras was broken up, and his disciples dispersed, some of them attended to the practice of medicine; and unlike the Asclepiads, who confined their consultations to the temples, the Pythagoreans visited the sick at their residences. Of the extent of their knowledge or the value of their treatment we have no means of forming a judgment. Even at this period it seems that there was still another class, the charlatans, who, without any pretension to education, offered their nostrums for sale in the market place. Beside the temples of Æsculapius and the schools of philosophy, the gymnasia undoubtedly contributed to form the earlier physicians. The gymnasiarchs directed the regimen of those who resorted to the gymnasia; they acquired practical skill in the treatment of the injuries to which their pupils were liable; they set fractures, reduced dislocations, directed frictions, dressings, &c.—In these various ways medicine had already made sensible progress when Hippocrates (born in Cos about 460 B. C.) collected the scattered knowledge of his time, and added to it by his own genius and observation. Of the numerous works ascribed to Hippocrates, enough are decided to be genuine by the unanimous consent of the learned to justify the veneration in which he has always been held as the father of rational medicine. Of anatomy the notions of Hippocrates were crude and limited, and must have been derived solely from the inspection of animals, since the religious prejudices of the ancients prevented the dissection of the human body, until a period long posterior to the one of which we speak. His physiology is on a level with his anatomy. The glands are spongy bodies destined to absorb moisture from the neighboring parts, and the brain, the largest of the glands, draws the vapors from the whole interior of the body. The use of the muscles is to cover the bones, &c. (Renouard, *Histoire de la médecine*.) The body itself is composed of the 4 elements differently combined in different individuals, and derived from them we have the 4 humors of the body, blood, phlegm, bile, and black bile, from which again are derived the 4 temperaments. Disease consists in a disordered condition of the fluids; these are subject to coction, which when complete terminates in a critical evacuation, the localization of the disease, and the formation of a critical abscess, the occurrence of erysipelas, &c. When coction could not take place the disease was mortal. Crisis was apt to occur on certain days, hence termed critical. He speaks of a principle which he terms nature (*φύσις*), which influences every part of the human frame, superintends all its actions, promotes those that are beneficial, and represses those that are injurious; the great ob-

ject of the physician was to watch the operation of this principle, to aid or restrain it, rarely to counteract it. He regarded acute diseases alone as the subject of treatment; chronic affections were esteemed beyond the resources of art. The great merit of Hippocrates lies not in his theories, but in his descriptions of disease; and when we bear in mind the limited scope of his methods and his ignorance of anatomy and physiology, we cannot but admire the sagacity and fidelity of his observations.—Not long after Hippocrates, Praxagoras of Cos, the last of the Asclepiads whose name is mentioned in the history of medicine, and probably belonging himself to the family of Hippocrates, observed the relation which exists between the pulse and the general condition of the system. None of his writings have been preserved. Aristotle was the son of a physician, and probably in the earlier part of his life himself practised medicine; his knowledge of the structure of the body, derived entirely from the dissection of animals, was far in advance of that of his contemporaries; and he laid so widely the foundations of comparative anatomy, that for ages little that was new was added to what he had written. He distinguishes between the nutritive, the sensitive, the motive, and the intellectual faculties. The first is common to plants and animals to every thing which lives and dies; the last is confined to a very few species of animals. The 8 first faculties reside in every part of the body; the intellect alone has a special seat. Where this is he nowhere expressly states, but it is evident from a variety of passages that he placed it in the heart. He speaks of the greater size of the brain in mankind, states that it is composed of two lobes and of the cerebellum, and mentions the ventricles. Of the nervous system he was ignorant, confounding the nerves with the tendons. Of the lungs his account is reasonably correct. The blood vessels as well as the nerves he derives from the heart, which alone contains blood of itself, that of the lungs being contained in the vessels connected with the heart. The blood is the most important of the fluids, and is necessary to life; deprived of it to a slight extent, the animal faints, to a greater dies, while its attenuation and alteration give rise to disease.—Soon after its foundation, Alexandria, under the fostering care of the Ptolemies, became the centre of the science and learning of the time. This was especially the case with regard to medicine; the formation of the Alexandrian library at a time when books were rare and expensive, the personal support of the Ptolemies, the new drugs which commerce brought from distant countries, and above all the authorization of human dissections, gave a great impulse to medical science. Unfortunately the works of the great men who illustrated the Alexandrian school have entirely perished, and we can only judge of them by the reports which are scattered through the writings of Aretæus, Celsus, Pliny, Galen, &c. Of the earlier members of the Alexandrian school, Herophilus

and Erasistratus were the most distinguished. The former was familiar with the lacteal vessels and their connection with the mesenteric glands; the muscles were no longer a mere covering for the bones, but their proper office was attributed to them. Erasistratus was acquainted with the functions of the nerves, and is said to have invented the catheter; while Ammonius, another member of the Alexandrian school, invented an instrument for the crushing of stone in the bladder, thus perhaps anticipating an improvement of our own day. With Herophilus and Erasistratus the zeal for anatomy seems to have died out; between them and himself, a period of 500 years, Galen enumerates 5 or 6 physicians only who occupied themselves with human dissections.—Until the rise of the Alexandrian school, dogmatism or rationalism, fortified by the authority of Hippocrates, had been the prevailing system. The dogmatists maintained that in order to treat disease we must be acquainted with its occult as well as exciting causes, and with the natural actions of the body, as concoction, nutrition, &c. To this Philinus of Cos and Serapion of Alexandria replied that the occult causes of the dogmatist depended entirely upon hypothetical opinions; that the minute motions and changes of the internal parts were beyond our observation; that even where the cause of a disease was known, it by no means followed that such knowledge led to a remedy; and that close observation of disease and experience of the effects of remedies in its treatment were the only safe guides to medical practice. The new doctrine, or empiricism as it was termed, long divided medical opinion with dogmatism, though the writings of its advocates have entirely perished, and we are acquainted with their views mainly through the summary given by Celsus. About 150 years after the origin of empiricism, Asclepiades of Bithynia, at first an eminent rhetorician, and as such honored with the intimacy of Cicero, began to practise medicine at Rome. A philosopher rather than a physician, he was a follower of Epicurus; and on the theories of his master he founded a new medical doctrine which, aided by the popularity of the Epicurean philosophy, as well as by its novelty and simplicity, soon found numerous followers. According to Asclepiades, the human body is permeated in every direction by pores through which at all times atoms varying in form and volume are constantly passing. Health consists in the symmetry between the pores and the atoms which pass through them. Disease is an obstruction of the pores or an irregularity in the distribution of the atoms. This theory was further developed by Themison of Laodicea, a pupil of Asclepiades, who made all diseases depend upon constriction or relaxation, or upon a third and mixed condition, while all remedies were divided into astringents and relaxants. Asclepiades, it is said, was the first to divide diseases into the two great classes of acute and chronic. While the dogmatists made the fluids

the prime seat of disease, and ascribed the origin of all maladies to some alteration in them, the methodists on the other hand thought the solids were first affected, and that the derangement of the humors was but secondary; and the dispute about the humoral pathology and solidism, thus originated, has under various forms continued to our own time.—For 600 years, according to Pliny, Rome had no physicians; not that no attempt was there made to cure diseases, but that these attempts consisted mainly in superstitious observances. Thus, according to Livy, following the advice of the Sibylline books, pestilence was repeatedly stayed at Rome by erecting a temple to Apollo or to *Æsculapius*, by celebrating public games, or by the dictator driving a nail into the capitol; and Cato the Censor trusted to simples with charms and incantations. When intercourse with Greece became common, Grecian philosophy and science were transplanted to Rome. As has been already mentioned, *Asclepiades* was the friend of Cicero, and Cæsar when he was taken by the pirates was accompanied by his physician. On attaining supreme power, Cæsar decreed that all physicians at Rome should enjoy the privileges of citizenship. After the names of *Asclepiades* and *Themison*, that of *Soranus* occurs prominently among those practising medicine at Rome; there were probably 3 physicians of this name, but the most celebrated was a Greek educated at Alexandria and settled at Rome; his writings have perished, unless, as some have supposed, those of *Cœlius Aurelianus* are a translation of them. *C. Aurelianus* is said to have been a native of Numidia, and probably flourished early in the 2d century. Of numerous works of which he was the author, that on acute and chronic diseases is alone preserved. It is written in barbarous Latin, but in its description of disease is a great advance on earlier authors. *C. Aurelianus*, like *Soranus*, belonged to the methodic sect, and is its principal exponent. Of the few Latin medical authors, *Celsus* is the chief. As is the case with so many of the physicians of antiquity, we know nothing of his personal history, and are uncertain indeed whether he ever practised medicine. He would appear to have lived toward the termination of the 1st century, and to have written voluminous treatises on a variety of subjects, on architecture, rhetoric, philosophy, &c., all of which have perished. His book *De Medicina* is a digest of what was known to the ancients on the subject, and shows the great progress which medicine had made in consequence of the labors of the anatomists of Alexandria. *Celsus* treats of most of the great operations of surgery, of the operations for stone and hernia, of wounds of the intestines, of catarract; he gives directions for the use of the catheter, speaks of the trephine in injuries of the brain, and of the use of the ligature in divided or lacerated blood vessels, in varices, and in hemorrhoids. The name of *Andromachus*, a native of Crete and physician to Nero,

has come down to us as the inventor of certain polypharmaceutical compounds, one of which, the *theriac*, containing the dried flesh of vipers, with 60 other ingredients, was retained in the pharmacopœias of the last century; and he is likewise the first to whom was given the title of *archiater*. Probably contemporary with *Cœlius Aurelianus* was *Areteus* of Cappadocia; we know nothing of him but his birthplace; he has left a treatise on diseases remarkable for accurate and spirited description, and which is one of the most valuable of the medical works of antiquity. We now come to *Galen* (born in Pergamus, A. D. 180), who after *Hippocrates* has had a far wider share of renown than any other physician; for more than 12 centuries his authority reigned supreme in the schools; even a fact was disputed if it was against the authority of *Galen*. He adopted the Hippocratic theory of the 4 elements, the 4 humors, and the 4 qualities, elaborating and refining upon them at great length and with great subtlety, and making them the groundwork of his doctrines. Beside the solids and the fluids, he assumed a third principle, the *spiritus*, as entering into our composition. These spirits were of 3 kinds: the natural spirits, derived from the venous blood; the vital spirits, formed in the heart by the action of the air we breathe upon the natural spirits, and which are driven through the arteries; and the animal spirits, formed in the brain from the vital spirits. He also supposed the human soul to be composed of 3 parts: a vegetative, residing in the liver; an irascible, in the heart; and a rational, having its seat in the brain. The most valuable of the works of *Galen* are those in which he treats of anatomy and physiology. He appears to have dissected animals only, and he recommends students to visit Alexandria, where they could study from the human skeleton. Considering the narrowness of his resources, his descriptions are wonderfully correct, and they comprehend all that was known of anatomy until the time of *Vesalius*. Another author, who lived probably in the latter part of the 2d century, *Dioscorides*, for many centuries shared the authority of *Galen*. He has left a work on the *materia medica* which comprises all that was known to the ancients upon the subject; its arrangement is bad, and the descriptions of the articles so vague that many of them can no longer be recognized with certainty; yet imperfect as it may be, it was for 1,500 years a standard treatise.—From the time of *Galen* medicine began to participate in the decline which had already overtaken art and literature. Dissections were no longer made; the earlier Christians had as great a horror of profaning the dead body as the pagans, and medical writers, appearing at rare intervals, contented themselves mainly with abridging or copying the works of *Galen*. *Oribasius* in the 4th century, *Ætius* in the 5th, *Alexander Trallianus* and *Paulus Ægineta* in the 6th, all wrote in Greek, and were all zealous *Galenists*. It is but just to observe that *Paulus* seems to have

been fuller than his originals in the description of surgical diseases and operations. It was only when medicine already tended toward its decline that it became legally organized. In the pagan world every one practised at his will, making his way by such qualities as he possessed. The injury done by quackery and imposture led finally to a remedy. Under the Christian emperors every town of a certain size had its archiateri (chief physicians), and no one could practise medicine without having undergone an examination by them. They were paid by the state, and in return were bound to attend the poor gratuitously. In a number of the principal towns medical schools were established, in which the professors and lecturers received a regular salary. The archiateri of the emperors had the title of count or duke, and ranked with the principal officers of state.—Hospitals and dispensaries owe their origin to Christianity; the pagans appear to have had no analogous institutions. The first hospital would seem to have been founded at Jerusalem by St. Paula toward the end of the 4th century, and the example once given was soon followed by the pious, the powerful, and the wealthy.—While the western empire had sunk into barbarism, and the eastern, sadly limited, was struggling for existence, medical science found refuge for a time among the Arabians. Excepting on two points, they contributed but little or nothing to its advancement; but Rhazes, Ali Abbas, Avicenna, Albucasis, with the Spanish Saracens Avenzoar and Averrhoes, were all voluminous writers. Their writings consist mainly of compilations from the Greek authors, and chiefly from Galen, whose subtleties and refinements were suited to their genius; yet the "Canon" of Avicenna was for several centuries the received text book in the medical schools of both the Arabians and Europeans; and all the knowledge Europe had of the Greek authors was derived from the translations of the Arabs. In two particulars, as was mentioned, the writings of the Arabians are of high interest: 1. In them we get the earliest clear account of the existence of eruptive fevers; these were divided by them into two forms, *variola* (small pox) and *morbilli* (the little pest), the latter including measles, scarlet fever, and probably other non-vesicular eruptions. It is impossible to determine whether these diseases now appeared for the first time, or whether, after having for ages been confined to some obscure corner of the East, they were now first distributed over the world by the conquests and commerce of the Saracens. It certainly seems very unlikely that a disease so well marked and leaving such permanent traces as the small pox could have previously existed in Greece or Rome without some account of it having been transmitted to us. 2. Not only do we derive from the Arabians a number of our milder purgatives, cassia, manna, senna, rhubarb, together with tamarinds, camphor, &c., but in their pursuit of alchemy they pro-

duced distilled liquors, some of the metallic salts, and many new pharmaceutic preparations, and laid the foundations of a science which has been of the most essential service to medicine.—As order again began to emerge from the chaos of barbarism which succeeded the fall of the western Roman empire, monks and priests became the principal physicians, and a little medicine was taught in some of the monasteries; for a long time the Benedictine monks of Monte Cassino enjoyed in this respect an extended reputation. From the 9th to the 18th century the Jews, acquiring in their commerce with the Saracens such knowledge as was possessed by the latter, became celebrated as physicians; and as such, despite the laws which forbade them to administer remedies to Christians, obtained access to courts and even to the palace of the Roman pontiffs. One small town affords a glimmer of light during the darkness of this period. The school of Salerno is said to have been founded about the time of the destruction of the Alexandrian library by the Saracens. Toward the end of the 8th century it had attained reputation, and from the 10th to the 18th was at the height of its celebrity. The *Regimen Sanitatis Salerni*, the dietetic precepts of the school of Salerno, composed by John of Milan for the use of Robert duke of Normandy, the son of William the Conqueror, has been frequently republished and commented. The most celebrated member of this school was Constantinus Africanus, who, driven from his native country as a sorcerer, for a time taught at Salerno. His works, which are numerous, are translations from the Arabic, written in barbarous Latin. In the course of the 18th century Frederic II. published an edict that no one should practise medicine in the kingdom of Naples until he had been examined by the faculty of Salerno. The candidate, after completing his course of studies, was examined on the Therapeutics of Galen, the first book of Avicenna, and the Aphorisms of Hippocrates. He afterward swore to be pure in his life, to be submissive to the laws, to attend the poor gratuitously, and not to share the profits of the apothecary. He then received a diploma, but for the first year was compelled to practise under the superintendence of an older physician.—About the year 1815 Mondini, a professor in the university of Bologna, dissected the bodies of two females; he afterward published an anatomical description of the body, illustrated with woodcuts, which for the next 300 years was used as a text book in the Italian universities. His merit consists mainly in the boldness of his undertaking, as his anatomy was not much in advance of that of Galen. He did not open the cranium for fear of committing a mortal sin. Before the year 1500 human dissections were prosecuted at Bologna, Padua, and Pavia. Toward the commencement of the 15th century Du Bois, or Sylvius, as his name was Latinized, used the human body in his demonstrations at Paris as often as it could be procured.

Galen was still looked up to as an indisputable authority; and when the results of dissection did not coincide with his descriptions, they were looked upon as exceptions to the general rule, or as evidence of the degeneracy of the human race. Such was the state of things when, about the year 1543, Vesalius, professor of anatomy in the university of Padua, published his great work on anatomy, in which he pointed out the errors of Galen, and maintained that his descriptions were taken, not from human dissections, but from those of apes. The age was one of anatomical discovery, and Columbus, the successor of Vesalius at Padua, Eustachius at Rome, and Fallopius, confirmed and increased the discoveries of Vesalius. The prejudices against human dissections were mitigated, subjects became comparatively abundant, and printing and engraving served to spread abroad and perpetuate the discoveries that were made. —After the fall of Constantinople, learned Greeks escaping from the captured city carried a knowledge of their language and literature to the western world. Previous to this date the Greek medical writers had been read only through the medium of faulty Arabic translations; but medical men now availed themselves of this new source of information, and translations of Galen, Hippocrates, Dioscorides, &c., were made directly from the Greek. Thomas Linacre, physician to Henry VIII. and to Mary, distinguished himself in this career; he established professorships at Oxford and Cambridge for illustrating the works of Hippocrates and Galen, and laid the foundations of the royal college of physicians at London. Among those distinguished in the same path were Mercuriali, Foës, and J. Fernel; and the attention of physicians as of the learned throughout Christendom was directed to rescuing and illustrating the remains of antiquity rather than to original research. —While medicine was thus recovering the ground it had lost, surgery too was improving. Physicians in the middle ages being invariably priests, whom a canon of the church forbids to shed blood, surgical operations commonly fell into the hands of an inferior and ignorant class of barber surgeons, who frequently were itinerants. Gradually matters improved, the clerical physicians occasionally operated, while the barber surgeon struggled to raise himself to a higher rank. Gui de Chauliac, a learned priest who published about the year 1363 the earliest modern work on surgery, operated himself; while in the 16th century the great anatomists Vesalius, Fallopius, &c., were likewise distinguished surgeons. It was from Ambrose Paré, however, who commenced his career as a barber surgeon, that surgery received its greatest impulse. At that period wounds received from firearms were considered poisonous, and it was customary on this account to cauterize their track with boiling oil. In 1636, on one occasion, while serving as surgeon with the French army in Provence, Paré's supply of oil failed him. He could not sleep for anxiety,

but in the morning he found that those who had not been doing better than those who had been cauterized, and the observation thus made soon led to a revolution in practice. The application of the ligature instead of the actual cautery to restrain hemorrhage after amputations was another of his discoveries. —While the authority of the Galenists was disputed by the anatomists on matters of fact, his opinions were attacked by a new school of physicians, who were the offshoot of the prevailing study of alchemy. Of this school Paracelsus obtained the greatest notoriety. He publicly burned the works of Galen and Avicenna at Basel, but had nothing to substitute for them but wild and incoherent speculations. Perhaps it was partly owing to the growing spirit of independent observation that we first hear during the 15th century of a number of new diseases. Whooping cough, scurvy, the sweating sickness, and syphilis were now first described. Of scurvy we must believe that the causes which produce it at present must have produced it from all time; and that if it seldom occurred in ancient times, it must have been because of the different modes of living and from the short duration of the voyages. With syphilis the case is different; the theory of the American origin of the disease is now shown to be destitute of foundation, and whether it had existed obscurely for a long time, or whether it arose, as some think, from a degeneration of the leprosy so prevalent in the middle ages, its sudden explosion at Naples in 1498 and its rapid spread throughout Europe are equally unaccountable. —The great anatomists of the 16th century had paved the way for the discovery of the circulation of the blood; Servetus had proclaimed the lesser circulation through the lungs; the valves of the heart, of the aorta, and of the veins were known; it was proved by experiments on living animals that when an artery was tied the blood no longer flowed, and the pulse ceased on the side most distant from the heart; that when a vein was tied it swelled below the ligature, while it became empty on the side toward the heart; and yet the last step was not made. At length William Harvey, after having for 12 years taught the circulation of the blood in his lectures, in 1628 published his doctrine to the world; and though meeting at first with opposition from some of the older members of the profession, it made rapid progress and was universally adopted during the lifetime of its discoverer. In 1661 Malpighi by the aid of the microscope showed the course of the globules of the blood in the smaller vessels, and 80 years later Leeuwenhoek was able to follow the circulation into the minutest capillaries. The true theory of respiration soon followed the discovery of the circulation. The ancients taught that the minute bronchial tubes inoculated with the pulmonary veins, and that the air thus found its way into the heart. In 1661 Malpighi demonstrated the vesicular substance of the lungs, and about the same time Borelli, Haller, and others showed the

mechanism by which respiration is accomplished. In 1622 Gaspard Aselli, professor of anatomy at Milan, discovered the lacteal vessels; and 25 years later Jean Pecquet demonstrated the reservoir which bears his name, together with the thoracic duct from its commencement to its termination in the left subclavian. The lymphatic system, the nerves, the brain, and the organs of special sense were all studied with care by observers whose names we have not space to enumerate. In 1747 Haller published his *Prima Linea Physiologia*, and 10 years later his *Elementa Physiologia Corporis Humani*; and from this period physiology had a distinct existence as a science.—In the mean time the materia medica had been enriched by a number of new articles. The chemists had introduced a variety of metallic and alkaline salts, and the new world had yielded guaiacum, sarsaparilla, ipecacuanha, &c.; but two remedies from their importance require a more special notice. On the first appearance of syphilis the surgeons had attacked it by means of mercurial frictions, and with success; but their employment in numerous instances was attended by such terrible consequences, that they gradually fell into disuse. Paracelsus had employed mercury internally, but in the hands of such a practitioner it could rarely be productive of other than mischief; the Galenists condemned its use, and the chemical physicians gave it rarely and secretly. Gradually it again came into favor, and in 1750 Van Swieten, the physician of Maria Theresa, directed all the cases of syphilis in the military and civil hospitals of the Austrian empire to be treated with small doses of corrosive sublimate in solution, and the practice soon became common throughout Europe. The ancients, with whom malarious diseases were common, had no specific means of arresting their attack; even mild intermittents often continued for an indefinite time, and finally induced organic changes and dropsy. In 1639 Peruvian bark is said to have been introduced into Spain by the countess of Cinchon; and though the extravagance of its price, the adulterations it sometimes met with, and its nauseousness were obstacles to its success, its use soon became common throughout Europe.—As chemistry, from vain search after the philosopher's stone or the *elixir vita*, began to assume the aspect of a science, it influenced more markedly the prevailing medical doctrines. Francis de Leboë or Sylvius, a Fleming called to the professorship of practical medicine in 1658, was the first to present a chemical theory of the actions of the animal economy. According to this theory, digestion and nutrition were the consequence of specific fermentations, in which the saliva, the pancreatic juice, and the bile take part. Fevers were produced by other fermentations caused by a vicious bile or lymph. Certain of the humors were naturally acid, others alkaline; in a state of health these were in equilibrium, but disease was consequent upon the predominance of one or the other. This

doctrine, more or less modified, had many followers, and for a time was prevalent both upon the continent and in England. Willis and Thomas Sydenham may be ranked among the iatro-chemists; but Sydenham is much the more remarkable for the careful and conscientious manner in which, uninfluenced by theory, he gave himself up to the observation of disease.—While the chemical school was taking form at the north, in Italy the progress of physical science was turning the attention of theoretic physicians in a new direction. Alfonso Borelli, a profound mathematician, was the originator of what has been termed the iatro-mathematical school. In the first part of his work *De Motu Animalium* he applies the received principles of physics to the subject of muscular action, treats of the various attitudes and modes of progression of men and animals, of walking, running, leaping, flying, swimming, and enters into learned and curious calculations of the amount of force which is expended in particular acts. In the 2d part he treats of the internal movements, of those of the heart, of the blood in the vessels, and of the action of the intestinal canal; the whole body was regarded as a machine, and the laws of mechanics, of hydraulics and hydrostatics, were rigidly applied to it. As an instance of the futile but elaborate calculations into which the mathematical physicians were led, Borelli calculates that the heart at each contraction overcomes a weight of 180,000 lbs. The physiology of the mathematical school had its influence upon their pathology; and the terms derivation, revulsion, lentor, obstruction, resolution, &c., all founded on physical principles, were universally used. The mathematical school had many and eminent followers throughout Europe—in Great Britain, Pitcairn, Freind the historian of medicine, and Mead; in Holland and Germany, Boerhaave and Jean Bernouilli; in France, Sauvages, the eminent and learned nosologist, and Senac, the physician of Louis XIV. Hermann Boerhaave, professor of medicine at Leyden, was possessed of great talent and immense learning, and was an accurate observer and a sagacious practitioner. He was one of the first to devote himself to clinical teaching, and he was fortunate in the devotion of such pupils as Van Swieten and Haller. Unfortunately for his permanent reputation, he lived in an age of transition, and his system, generally received during his lifetime, scarce survived its author. Jean Senac, another of the mathematical physicians, to whom Morgagni applies the epithet of "great," published a book on diseases of the heart, which has only been rendered obsolete by the introduction of the new methods of auscultation and percussion.—While the chemical and mathematical physicians were reducing the actions of the living body to the laws which govern inert matter, a wholly opposite tendency manifested itself in Germany. Previously indeed Van Helmont, a mystic and alchemist rather than a physician, in accounting for the vital operations, had introduced

what he termed the *archæus*, now a chemical ferment and now an intelligent being, as a controlling power; but his opinions found no followers, and only influenced indirectly the progress of medicine. George Ernest Stahl, a great chemist as well as physician, appointed professor of medicine in the university of Halle in 1694, was the author of the new system. According to Stahl the *anima* (the soul) is the great motor and directing principle of the human body. It exercises a recuperative and superintending influence, guards against injuries, or when they occur takes the best means of repairing them; it is the common source of all motion, of all secretion, of all the vital actions. In showing the insufficiency of the known chemical or physical forces to account for the vital actions, Stahl is happy and ingenious; but in his subtle disquisitions on his own agent, he becomes confused and unintelligible. He has the merit of showing much more clearly than had hitherto been done the influence which the mind exerts over the body. Stahl's opinions, contrary to most theories, exerted a controlling influence over his medical practice, reducing the office of the physician to that of watching and forwarding the operations that nature undertakes for her own relief; while his doctrines, set forth with great logical subtlety, at a time when metaphysical speculations were in vogue, though they found few direct followers, yet had a large influence on the minds of the profession. Friedrich Hoffmann, a fellow professor with Stahl at Halle, was a voluminous writer, whose reputation has extended to our own time. He attributed to the nervous system most of the functions and influences which Stahl ascribed to the *anima*. In speaking of the animal fibre, he ascribes to it a certain natural "tone," which may be increased into "spasm" or diminished to "atony;" and connected with both these hypotheses, while admitting the fluids to be sometimes primarily diseased, in the majority of cases he thought the solids were first affected.—As early as 1752 Boissier de Sauvages of Montpellier published his methodic nosology, in which he endeavors to class and distinguish diseases in the same manner as the vegetable kingdom is classed and described by the botanists. His work was of great use in the advancement of medicine, and remained the standard treatise on the subject until the publication in 1772 of the nosology of Cullen. This author, a professor first in the university of Glasgow and afterward in that of Edinburgh, contributed greatly to raise the latter school to the high rank which it has since enjoyed. His teaching and writings exercised a wide influence, and their effects can still be traced in English medicine in our own day; his descriptions of disease in particular are remarkable for their force and conciseness, but the progress of science has shown the fallacy of the views on which his system was founded. A contemporary and rival of Cullen, John Brown, a man of genius but of wayward and ill regulated character, was likewise the author of a sys-

tem which enjoyed a temporary popularity, and which, somewhat modified, found eminent followers in Italy within a recent period.—The end of the last century witnessed the most important practical discovery ever made in medicine. Up to that period small pox annually committed the most fearful ravages; the deaths from it in Europe alone were estimated to amount to 400,000 a year, while it left many others blind or disfigured. The practice of inoculation, brought from Constantinople by Lady Mary Wortley Montagu, had indeed diminished the evil, but the remedy itself was attended with great inconvenience, and was not destitute of danger. The discovery of Jenner, announced in his "Inquiry into the Causes and Effects of the Variolæ Vaccinæ" (London, 1798), has placed the disease completely under our control; and if it still commits occasional ravages, it is owing to the laxity of the laws and the carelessness of individuals. Another great improvement in practical medicine, the use of lemon juice, sour kraut, &c., in the dietary of seamen, by which scurvy, which formerly committed fearful havoc on both the naval and mercantile marine, has become almost unknown, is due to the naval surgeons of the last century.—In the last 60 years practical medicine has made greater advances than in any other similar period. This may be attributed: 1, to the brilliant discoveries which have rendered chemistry a new science, by the aid of which we are now able to comprehend much more clearly than before the processes of nutrition, respiration, calorification, secretion, and excretion; 2, to the increased attention paid to microscopy, by which the mode of development of the germ, the organization and growth of the different tissues, the process of repair and that of inflammation, and other morbid processes, have been investigated; 3, to the rapid progress of experimental physiology, aided by chemistry and microscopy; 4, to the increased cultivation of comparative anatomy and physiology; 5, to the cultivation of morbid anatomy not only in relation to the symptoms of disease during life, but to the various degrees of morbid developments, and to the relation which those developments bear to each other; 6, to the new and more perfect methods of investigating disease, by which its diagnosis has become more certain. Under the last head two discoveries are prominent, which have changed the whole face of medicine, giving it a degree of certainty which at one time seemed hopeless—that by Laennec of auscultation and percussion, and that by Bright of the disease of the kidney which bears his name. The development and perfecting of each of these discoveries has employed and is employing the lives and founding the reputation of a crowd of learned, zealous, and able men. 7. The discovery by pharmaceutical chemists of the active principles of various drugs, has not only rendered those drugs more certain and less nauseous, but has enabled us to exhibit necessary doses which the stomach otherwise would be unable to retain. 8. Not

only has the materia medica been benefited in the manner above mentioned, but by the discovery of various other remedies, by which diseases hitherto rebellious have been rendered more amenable to the resources of art; and by that of anæsthetics, one of the greatest boons medicine has ever conferred upon suffering humanity. (See HOMŒOPATHY, HYDROPATHY, and SURGERY.)

MEDINA. I. A S. W. co. of Texas, drained by the Medina river and Hondo and Seco creeks; area, about 1,100 sq. m.; pop. in 1850, 909, of whom 28 were slaves; present white pop. estimated at 1,500. The surface is rolling and in some parts hilly, and the soil fertile. In 1859 there were 18,200 head of cattle, and in 1857 10,000 acres under cultivation in Indian corn. Aggregate taxable property in 1859, \$447,255. Capital, Castrovilla. II. A N. co. of Ohio, drained by Black and Rocky rivers; area, 425 sq. m.; pop. in 1850, 24,441. The surface is uneven and the soil fertile. The productions in 1850 were 182,446 bushels of wheat, 418,027 of Indian corn, 215,330 of oats, and 806,602 lbs. of wool. There were 6 grist mills, 18 saw mills, 4 iron foundries, 8 tanneries, 42 churches, and 9,915 pupils attending schools. Capital, Medina.

MEDINA (Arab. *Medīnet el Nabī*, "city of the prophet"), a city of Arabia, in the province of El Hejaz, situated upon the vast plateau of high land which forms central Arabia, about 250 N. from Mecca, in lat. 25° 15' N., long. 39° 30' E.; pop. about 18,000. It is the second in sanctity of the three holy cities of the Mohammedans. The sacred area is embraced within an imaginary line forming an irregular circle, of which the town is the centre, and of which the diameter is about 12 m. The place consists of 8 parts, a town, a fort, and a large suburb. The town itself is a walled enclosure, forming an irregular oval with 4 gates. The walls are well built of granite and lava blocks in regular layers, cemented with lime. The streets are narrow and dark, and only paved in a few places. There are few public buildings. The houses are well built of brick, basalt, and palm wood; the best of them enclose spacious courtyards and small gardens with wells. The castle joins on to the N. W. angle of the city, whose wall its own wall resembles, but its towers are more solid. The suburbs lie to the S. and W. of the town, and between it and them is the plain of El Munakhah, about 1,200 yards in length by 800 in breadth. In the suburbs the only buildings of importance are the governor's house, a plain building, and 5 mosques of stone, surmounted by cupolas and minarets. The mosque of the prophet, which is at the eastern extremity of the city, is the principal edifice, and is one of the most famous temples of the East. It is held in peculiar veneration by the Mohammedans, and a saying of Mohammed is cited to the effect that one prayer in this mosque is more efficacious than 1,000 in other places, save only the mosque at Mecca. The approach to the building is

choked up by common structures, some actually touching it, others separated by narrow lanes. There is consequently no general view to be had, and the building has a mean and tawdry appearance. It is a parallelogram about 420 feet long by 340 broad. It has a spacious central area open to the sky, surrounded by a peristyle with numerous rows of pillars, surmounted by small domes. There are 5 gates and 5 minarets. In the centre of the court is a piece of ground about 80 feet square enclosed by a wooden railing, and called the garden of Fatima, the prophet's daughter. Near this enclosure is the well of the prophet. In the covered part of the mosque are the tombs of Mohammed and of the caliphs Abubekr and Omar. They are concealed by a curtain of silk, and nothing is known with certainty about them, as they have never been seen by a Christian, and the accounts given by Mohammedan writers are very contradictory. At present even Mohammedans are not allowed to see them, the officers in charge declaring that whoever should look upon them would be blinded by supernatural light. This mosque has been many times destroyed and rebuilt, the last time in 1710. There is little commerce at Medina, and what trade exists is in grain, cloth, and provisions. The climate, though hot in summer, is severely cold in winter, owing to the elevation above the sea. The people are proud and indolent, and live in great part upon the revenues of the mosque, which has estates in almost all parts of the Mohammedan world.—Medina is of unknown antiquity. It is mentioned by Ptolemy under the name of Jathrippa, and is celebrated in Mohammedan history as the place to which the prophet fled from persecution at Mecca, and at which he died. From 682 to 678 it was the seat of the caliphate. Its subsequent history is of little importance.

MEDITERRANEAN SEA, a large inland ocean, almost landlocked, which divides Africa from Europe and touches Asia on its eastern extremity. Extending from lat. 80° to 46° N., and from long. 6° to 36° E., it has a length of 2,300 m., and a breadth varying from 1,200 to 80 m. (between Cape Bon in Africa and Sicily). Its area, including all its lesser basins and inlets, is over 1,000,000 sq. m. Its only point of connection with the Atlantic ocean is the strait of Gibraltar, through which a strong current toward the E. is perceptible, owing to the fact that the Mediterranean does not receive a sufficient afflux from rivers to make up for the loss of water caused by evaporation. A like current enters the Mediterranean proper through the straits of the Dardanelles from the Black sea, which is better supplied by large rivers. The current from the W. flows along the N. coast of Africa to Syria, where it turns to the N., and, being united with the current from the Black sea, flows along the European shore. In the Adriatic sea it flows up on the Dalmatian and down on the Italian coast, forming in the straits between Italy and Sicily the whirlpools which appeared so dread-

ful to the unskilful navigators of ancient times. The depth of the Mediterranean sea averages 3,000 feet, and is even 5,000 feet in many places, while in others the bottom is only from 40 to 180 feet below the surface. Such is especially the case between Sicily and Africa, and this is the principal basis of a theory according to which Europe and Africa were in an early period united at two points, Gibraltar and Sicily. The waters of the Mediterranean are subject to tides, which, however, are inconsiderable in comparison with other seas, and very irregular. The water is more salt than that of the Atlantic ocean, the proportion of saline ingredients which they respectively contain being as 41 to 88. The prevailing color is a deep blue, which changes into a greenish hue in the Adriatic, and further E. approaches purple. Beside a number of small streams, there are only 5 rivers of any importance emptying into the Mediterranean: the Ebro, Rhone, Po, and Adige on the N. shore, and the Nile in Egypt. The prevailing winds are mostly from the N. and W. Some of them are known by specific names, such as the mistral, a cold wind blowing from the Alps along the valley of the Rhone to the sea; its opposite, the sirocco, a scorching hot wind carrying the dry heat of the African deserts over the N. coast of Sicily and all Italy; and the bora (Boreas of the ancients), a N. wind usually accompanied by terrible thunderstorms. These winds, with waterspouts, which are very frequent, especially in the W. basin, render the navigation of the Mediterranean rather dangerous during certain seasons of the year. One of the peculiarities of the Mediterranean is the frequent occurrence of remarkable electrical phenomena, known as the St. Elmes fire, being balls of fire playing in mid air around the masts of ships, and called by the ancients Oastor and Pollux. The scenery of the coast is as variegated as its lineal configurations. The entrance of the sea is marked by the steep and lofty rocks of Gibraltar and Ceuta (the pillars of Hercules), and the same character appears in the headlands by which the Pyrénées terminate at the sea, the Apennines on the gulf of Genoa, the Acroceraunian mountains on the Dalmatian and Albanian coast, and Mta. Pelion, Ossa, and Olympus on the coast of Thessaly; while at a great many other places the shore is low and even marshy. This is the case on a great part of the coast line of Italy. The African shore, with the exception of its westernmost part, is almost wholly devoid of considerable headlands. The shores of Naples and of Greece are especially celebrated for the beauty of their scenery. Of the many islands which dot the Mediterranean, Sicily, Sardinia, Candia or Crete, Cyprus, Negropont (the ancient Eubœa), and Corsica are the most extensive. Beside these, the Balearic islands (Majorca, Minorca, and Ivica), Malta, the Ionian islands, and the islands of the archipelago deserve to be mentioned.—The Mediterranean was known to the ancient Romans as the *mare internum*,

though the specific designations of its different portions (Adriatic sea, *Ægean* sea, Tyrrhenian sea, Propontis or sea of Marmora, gulf of Genoa, gulf of Valencia, &c.) were more common. The shores of the Mediterranean have for thousands of years been the principal seats of civilization. The most important periods of the history of mankind have been determined by the rule of different nations over the countries bordering on this vast inland ocean. The Egyptians, the Phœnicians, the Hebrews, the Greeks, Romans, Carthaginians, and Saracens flourished there under distinct forms of society. The Mediterranean was always considered as the focus and the point of gravitation of political power, and even now every commanding position there is anxiously coveted by the nations that are able to aspire to political preponderance in Europe.

MEDOC. See BORDEAUX WINES.

MEDUSA. See JELLY FISH.

MEDUSA. See GORGONS.

MEDWAY (anc. *Vaga*), a river of England, which rises in the S. E. part of Surrey, and, after traversing Kent in a N. N. E. direction, falls into the estuary of the Thames at Sheerness near its mouth. It is about 60 m. long, and navigable to Penshurst, a distance of 40 m. In its lower course it expands into a broad, deep tidal inlet, and a little above its embouchure it sends off a navigable branch on the right called the East Swale, which cuts off from the mainland the isle of Sheppey. The Medway is one of the most important havens for the British fleet, and on its banks are two large government dockyards, Sheerness and Chatham. Ships of the line can anchor in the channel as far up as Maidstone.

MEEK, ALEXANDER BEAUFORT, an American author and lawyer, born in Columbia, S. C., July 17, 1814. His father, a physician and clergyman of the Methodist church, removed with his family to Alabama in 1819, and settled at Tuscaloosa. The son was graduated at the university of Alabama, and in 1835 was admitted to the bar, and in the same year became editor of the "Flag of the Union," a democratic journal published at Tuscaloosa. In 1836 he went to Florida as lieutenant of volunteers against the Seminole Indians. The campaign lasted 8 months, at the close of which Mr. Meek returned home and was appointed attorney-general of the state; but he soon resigned this office for the purpose of engaging regularly in the practice of his profession. In 1839 he edited "The Southron," a literary monthly at Tuscaloosa. In 1842 he was appointed judge of the county court of Tuscaloosa co., and held this office for nearly two years, during which time he prepared and published a supplement to the "Digest of Alabama." In 1845 he was appointed law clerk in the office of the solicitor of the treasury at Washington, and in 1846 removed to Mobile, having received the appointment of U. S. district attorney for the southern district of Alabama, an office which he held for 4 years. In 1848 he became associate editor

of the "Mobile Daily Register," which position he held for 5 years, though at intervals during that period his editorial labors were interrupted by other duties. In 1858 he was elected to the legislature, where he distinguished himself by originating and securing the establishment of a free school system in Alabama. In 1854 he was appointed judge of the probate court of Mobile co. to fill a vacancy, and at the election in the following year was an unsuccessful candidate for the same office. In 1855 he published "The Red Eagle, a Poem of the South," a romance founded upon the career of Weatherford, the famous chief of the Creek Indians. In 1856 he served as presidential elector on the democratic ticket. In 1857 he published a volume of orations, sketches, and essays entitled "Romantic Passages in South-Western History," and "Songs and Poems of the South," being a collection of his miscellaneous productions for several years. In 1859 he was again elected to the legislature, and upon the meeting of that body he was chosen speaker of the house. Beside the works enumerated, he has delivered before different societies a great many orations, essays, and criticisms, in prose and verse, and has now (1860) nearly ready for the press a history of Alabama.

MEERSCHAUM (Germ., sea foam, so called from its lightness and whitish appearance), or **MAGNESITE**, a hydrous silicate of magnesia, of composition represented by the formula $MgO, SiO_2 + 2H_2O$. It is a mineral of soft earthy texture somewhat resembling chalk, of hardness 2.5, and of variable specific gravity. It is found in Spain and several countries at the head of the Mediterranean, occurring in the form of veins in serpentine, and also in tertiary deposits. Dr. J. Lawrence Smith found it in Asia Minor in alluvium, apparently the result of the decomposition of carbonate of magnesia belonging to neighboring serpentine rocks. It is largely collected there for the manufacture of pipes and cigar tubes, the town of Kouieh furnishing the principal supplies. It is roughly shaped into blocks, or sometimes into rude forms of pipes, for exportation, and freed as far as practicable from the associated minerals which impair its quality by interfering with the carving and smoothing of its surface. It is fashioned into finished pipes, which are often highly ornamented, in different cities of Europe. Pesth and Vienna were formerly famous for this manufacture. To produce the yellow and brown colors, which are much admired in the pipes, and which are brought out only after long smoking, the blocks are kept for some time in a mixture of wax and fatty matters. A portion of these is absorbed, and, being subsequently acted upon by the heat and the tobacco fumes, assumes various shades of color. The lightest qualities are too porous for producing the best pipes; and the heaviest are rejected from suspicion of their being artificial products. These artificial preparations are from the parings of the genuine material, which, being reduced to fine powder

are boiled in water and moulded into blocks, sometimes with the addition of clay. After drying and contracting, they are ready for carving. This kind is known by the name of *massa-bôpsa* or *massa bowls*. In the jury report of the London exhibition of 1851, it was stated that there was no certain test for distinguishing the real meerschaum from the preparations. The latter are generally heavier, and are more free from blemishes, some of which, arising from the presence of foreign minerals, are often seen in the genuine meerschaums. The value of the pipes and cigar tubes imported into the United States in 1858, it is stated, amounted to \$200,000.

MEERUT, a British district of Hindostan, in the lieutenant-governorship of the North-West Provinces, forming part of the Doab, and bounded E. by the Ganges and W. by the Jumna; area, 2,382 sq. m.; pop. in 1851, 1,135,072, of whom 885,238 were Hindoos. A ridge of low hills traverses the district from N. to S., separating the valleys of the Ganges and Jumna, but the general character of the surface is remarkably level. The soil is abundantly watered by the two great rivers above mentioned, and by the Ganges canal, about 50 m. of which lies in the district of Meerut. The vegetation of the tropics alternates here with that of more northern latitudes, wheat being cultivated in the cool season, and sugar cane, indigo, and cotton in the wet. The climate is one of the finest in India.—**MEERUT**, the capital of the above district, is situated on the river Kalee Nuddee, nearly equidistant from the Ganges and the Jumna, 930 m. N. W. from Calcutta, and 82 m. N. W. from Delhi; pop. 29,014. The streets are narrow and dirty, and the native part of the town is wretchedly built, though it contains some ruined mosques and pagodas of considerable architectural interest. It is an important military station, having an extensive cantonment about 2 m. distant. The English church, which is capable of holding 8,000 people, is one of the finest in India.—Meerut is noted as the scene of the outbreak of the sepoy rebellion in 1857. It contained at that time about 4,500 troops, nearly half of whom were Europeans. The native soldiers showed insubordination as early as the month of April; and on May 9, 85 troopers were imprisoned for refusing to receive the new cartridges. On the next day, Sunday, the comrades of these men and the sepoys of the 20th native infantry rushed from their lines on a given signal and proceeded to the quarters of the 11th native infantry, whose colonel fell riddled with balls while endeavoring to persuade them to return to their duty. The 11th now joined the rebels, the imprisoned troopers were released, 1,200 ruffians were let loose from the gaol, and the mutineers and the rabble began to set fire to the cantonment and to murder every European who fell in their way. In the mean time the English troops, who properly commanded would have been a match for 4 or 5 times their number of natives, were manœuvred with such inefficiency that the reb-

els had their own way for several hours, and then took the road to Delhi, scarcely any attempt being made to pursue them. The British commander, Gen. Hewitt, was much censured for his conduct at the time, but in the judgment of many his course was after all the wisest that could have been taken under the circumstances.

MEGALONYX (Gr. *μεγας*, *μεγαλη*, great, and *οὐξ*, claw), an extinct genus of giant edentates, allied to the sloths, established in 1797 by Thomas Jefferson, in a communication to the American philosophical society of Philadelphia, in whose "Transactions" the bones were described by Dr. Caspar Wistar, who first suggested the affinity of the animal to the recent sloths. The first bones were discovered in a limestone cavern in western Virginia, and were referred by Mr. Jefferson, from the large size of the claws, to some carnivorous animal; the original specimens of this, the *M. Jeffersonii* (Harlan), are in the cabinet of the academy of natural sciences at Philadelphia. These, and other bones found in Tennessee, Kentucky, Mississippi, and Alabama, form the materials of the most complete monograph on the subject, that of Prof. Joseph Leidy, in vol. vii. of the "Smithsonian Contributions to Knowledge" (1855). The skull is about 14 inches long, with the upper outline nearly horizontal, depressed forehead, and convex nose; the sagittal crest prominent and rugged; zygomatic process strong, and temporal fossa rough for the attachment of muscular fibres; the mastoid process strongly marked; the orbital cavity shallow; the hard palate between the 8 posterior molars 14 lines wide, with a median convexity nearly as prominent as the teeth, becoming almost plane in advance of the 3d molars, and varying in width from $2\frac{1}{4}$ to 4 inches, perforated by large foramina and by a large incisive foramen between the 1st molars; the occipital foramen circular, 16 lines in diameter, the surface of this bone being rough for the attachment of powerful muscles; orifice of nose irregularly circular, about 8 inches in diameter; lower jaw about 18 inches long. The teeth are long, without fangs, sub-elliptical, of nearly uniform diameter, with the crown hollowed in the middle and projecting border; as in other edentates, they are deeply excavated from the bottom for the persistent dental pulp; they have no enamel, being composed of very porous dentine in the centre, surrounded by a harder layer of the same which is enclosed by a thinner crust of cementum; the formula is $\frac{3}{1}-\frac{3}{1}$, the anterior tooth being considerably in advance of the others, in form and position like a canine; they vary in diameter from 8 lines to an inch; the rami of the lower jaw are widely separated, and the symphysis narrow. The bones of the skeleton are strong, though less so than in the allied megatherium; the scapula is about 14 feet long, the humerus 20 inches; the thigh bones relatively shorter and broader than in the sloths and about 21 inches long; the tibiae

relatively very much shorter than in the sloths, but of greater relative length than in the mylodon; the shaft of the humerus suddenly expands toward the lower extremity, and is pierced by a large foramen; the astragalus like that of recent sloths, $5\frac{1}{4}$ by $3\frac{1}{2}$ inches; the heel bone developed in an extraordinary manner, being long, compressed, and high; the phalanges large and narrow, and armed with powerful claws; the tibia and fibula distinct, and the foot articulated obliquely, the last leading Mr. Lund to the opinion that the animal was a climber; the anterior limbs a little larger than the posterior; the tail strong and solid. From the study of the toes Cuvier pronounced the animal an edentate; the well-marked ridge in the middle of the articulating surface of the last phalanx indicates a more restricted motion than in carnivora, to which Mr. Jefferson referred it; the upper edge extends further back than the lower, preventing the claws from being raised above a horizontal line, but permitting complete flexion below, as in sloths; their form and proportions are also those of edentates; the middle and ring fingers are large, with very strong claws, the index being smaller with a less strong claw, and the thumb and little finger rudimentary. This animal was less heavy in form than the megatherium, which it doubtless resembled in its habits; it was probably of the size of a large ox. The bones are found in the pleistocene or drift formations of America, contemporaneous with the elephant and mastodon, and perhaps surviving them; bones of another species are found in Brazil. Like the megatherium, it probably used its powerful claws, not to dig subterranean retreats, nor to climb, nor to uncover edible roots, but to loosen trees, and break them down by its weight, in order to feed upon their leaves. (See MEGATHERIUM.)

MEGALOPOLIS, a city of ancient Greece, in the territory of Arcadia, on the river Helisson. It was founded at the suggestion of Epaminondas, after the battle of Leuctra, in 371 B. C., and was designed by him as a counterpoise to the power of Sparta. Forty townships furnished inhabitants for the new city, which was 50 stadia in circumference, and had a larger domain allotted to it than that possessed by any other Arcadian state. Megalopolis, from the period of its foundation, became the capital of the Arcadian confederacy, and the seat of the general assembly. Apprehension of Sparta afterward drove the Megalopolitans into alliance with the Macedonians, and held them aloof from the coalition formed in Greece on the death of Alexander for the recovery of independence. They at length fell under the dominion of tyrants, the last of whom, Lydiades, resigned his authority in 234 B. C., and united Megalopolis to the Achaean league. In 222 Cleomenes III., king of Sparta, captured it by surprise, and destroyed the greater part of it; but after his defeat at the battle of Sellasia, the Megalopolitans who had previously fled returned under the conduct of Philopœmen,

and rebuilt their city, which however never regained its former prosperity, and on the death of Philipæmen rapidly sunk into insignificance. Polybius the historian was a native of this city. The ruins of its theatre, once the largest in Greece, are still to be seen at the village of Sinano.

MEGALOSAURUS (Gr. *μεγας*, great, and *σαυρα*, lizard), a gigantic fossil reptile of the family of dinosaurians, which includes the iguanodon, previously described. This family, entirely extinct, was remarkable for great size and for certain mammalian characters; the long bones have a medullary cavity, the feet are short and pachyderm-like, the sacrum composed of at least 5 anchylosed vertebrae, the ribs doubly articulated to the spine, the vertebral laminae greatly developed, and the lower jaw capable of a horizontal triturating motion; but the teeth, scapular arch, and most of the skeleton resemble those of lizards. The genus *megalosaurus* (Buckland) was discovered by Dr. Buckland in the Stonesfield oolite near Oxford, Eng.; their remains have also been found in the wealden and jurassic formations. The *M. Bucklandi* (Cuv.), the best known species, had probably a straight muzzle, thin, and laterally compressed; the teeth were flat, pointed, curved backward like a pruning knife, with the enamel of the posterior edge serrated to the base, and for a short distance from the point also on the anterior; the structure of these teeth, calculated to lacerate flesh and to hold a prey once seized, shows that the animal was highly carnivorous. The teeth, some of them 8 inches long, were implanted in distinct sockets formed by partitions running across from the higher external to the lower internal border of the jaw, combining crocodilian and lizard characters. This animal must have attained a length of 30 or 40 feet; it was terrestrial, and probably preyed upon the smaller reptiles and the young of the larger.—The dinosaurian genus *hylasaurus* (Mantell), or wealden lizard, was discovered by Mantell in the wealden of Tilgate forest in 1832; it shows a similar blending of crocodilian and lizard characters. The bodies of the vertebrae are biconcave, rather short, with well-developed laminae and large processes; the transverse processes indicate the support of large dermal plates, and perhaps of a dorsal crest as in iguanas; the scapula is crocodilian, and the coracoid lacertian; the teeth were probably like those of the pleurodont lizards; the locomotive organs are imperfectly known; its length has been estimated at from 25 to 30 feet. The *H. armatus* (Mantell) was terrestrial and carnivorous.

MEGARA, a city of ancient Greece, capital of Megaris, situated about 1 m. from the sea, opposite the island of Salamis, 26 m. N. W. from Athens, and 31 m. N. E. from Corinth, in lat. 38° N., long. 28° 21' E. It consisted of a double acropolis and the city proper. The more ancient acropolis is said to have been built by Car, son of Phoroneus; the other, together with the city, by Alcathous, son of Pelops. Subsequently, however, a Dorian colony, under Alethes and

Athemenes, took possession of the city, and enlarged it. Its original name appears to have been Polichne. In the 7th and 8th centuries B. C. Megara was opulent and powerful, and sent forth several colonies by whom the cities of Megara Hyblæa in Sicily, Astacus in Bithynia, and Chalcedon and Byzantium on the Bosphorus were founded. It even entered into a contest with Athens, in the time of Solon, for the island of Salamis, but was at length constrained to yield. In the Persian war it contributed 3,000 hoplites and 20 ships to the confederate forces. After the conclusion of that struggle Megara deserted the Peloponnesian confederacy, and joined that of Athens, to which ere long it became virtually subject; and the Athenians, to secure their supremacy over it, built the long walls which connected Megara with its port Nisæa. The Athenian garrison, however, was expelled by the aid of some Peloponnesian troops in 445 B. C. This so exasperated the Athenians that they passed a decree excluding the Megarians from their markets and harbors, which decree operated so injuriously to the interests of the latter that its enforcement was one of the pretexts advanced by the Spartans and their allies for the commencement of the Peloponnesian war. During that war Megara suffered severely from siege and famine, the Athenians being still in possession of Nisæa; and subsequently, though it recovered a considerable portion of its ancient prosperity, it does not figure prominently in history. It was celebrated for its philosophical school, founded by Euclides, the disciple of Socrates. Comedy is said to have been invented in Megara, and introduced thence into Athens. Theognis, the elegiac poet, was born there.

MEGARIS, a district of ancient Greece, bounded N. by Boeotia, E. by Attica, S. by the Saronic gulf, and W. by Corinth and the Corinthian gulf; area about 148 sq. m.; capital, Megara. It is in general a rugged and hilly country. The principal mountains are Mt. Oithæron, which separates it from Boeotia, and the Geranean chain, which extends E. and W. across its S. part from sea to sea. Through this chain are three passes: one, styled the Scironian pass, runs by the Saronic gulf, and formed the direct road from Corinth to Athens; another, which runs along the Corinthian gulf, was the great thoroughfare between Boeotia and Peloponnesus; and a third crosses the centre of the mountains. The territory of Megaris contains no plain except that in which its metropolis stood. Its aboriginal inhabitants were Æolians and Ionians, and it originally constituted part of Attica.

MEGATHERIUM (Gr. *μεγας*, great, and *θηριον*, animal), an extinct edentate animal, of gigantic size, coming in many respects near to the sloth family, and with its allies, the megalonyx and mylodon, seeming to form the transition from the edentates to the pachyderma. Pictet calls the family gravigrades, placing them between the sloths and the armadillos; in all the molars are hollow cylinders of dentine

and cement without enamel, the tube of dentine being filled with a porous substance; the form of the head, which is short and truncated, the large descending zygomatic process, and many parts of the skeleton (as the union of the acromion and coracoid processes of the scapula), resemble those of the sloths; the teeth consist only of molars, the canines of the sloths being absent; in their heavy forms, nearly equal limbs, and long and strong tail, they come nearer the armadillos and ant-eaters. The genus *megatherium* (Ouv.) is the first described of the family, the first skeleton having been sent in 1789 from the vicinity of Buenos Ayres to Madrid, where it now remains; since then other skeletons and fragments have been discovered in Peru, Paraguay, and other parts of South America; another species is described by Dr. Leidy in North America. This genus is distinguished from the other megatherioids by the quadrangular prismatic form of the teeth and the marked transverse ridge on the crown; the dental formula is $\frac{4}{4}$; the anterior limbs have 4 fingers, the posterior only 3, the 2 outer being without nails, the others with large claws. The well known South American species, *M. Oviari* (Desm.), is intermediate in size between the elephant and the rhinoceros; the skull is relatively longer than in sloths, and the large foramina for the passage of nerves and vessels indicate that the animal had very thick lips; the teeth, from 7 to 9 inches long, are implanted deeply in firm alveoli, and the ridges of the upper fit into the depressions of the lower; the lower jaw is large and heavy; the vertebrae are 7 cervical, 16 dorsal, 8 lumbar, 5 sacral, and 15 caudal, of medium size in the anterior portions of the body; those of the tail are enormous, the largest measuring 18 inches from one end of the transverse process to the other; the V-shaped bones are also greatly developed, the tail serving as a means of support and perhaps of defence; the ribs are short and thick, and roughened for muscular attachments. The anterior limbs are remarkable for the strength of the shoulder, the clavicle being massive and curved like the letter S, and the acromion and coracoid processes united; the humerus is much enlarged at the lower portion to support a wide ulna and a radius freely turning around it, as in the monkeys and sloths; the large processes indicate immense force of rotation; the fore feet were strong, and armed with powerful claws. The pelvis is very large and solid, measuring 4 feet from hip to hip, considerably more than the largest elephant; the cotyloid cavity is directed downward, so that the thigh bones support the body without obliquity, securing great strength and solidity at the expense of rapidity of motion; the thigh bones are at least 3 times as thick as in the largest elephants, and the length is only double the width; the tibia and fibula are very thick, and united at the top; the heel bone is almost as long as all the rest of the foot, and the nail of the middle toe enormous. These details suffice to show that the megatherium

was a very large and powerful animal; the entire fore foot being about a yard long and the claws set on obliquely to the ground, it may be inferred that the anterior limbs were principally used for the purpose of digging; the great size of the pelvis and hind legs, and strength of the tail, were necessary to sustain so heavy an animal in an upright position while using its fore feet in digging around the trees which it afterward prostrated by the weight of its body. The teeth show that it was herbivorous, feeding on the stems and roots of trees and succulent fruits. Their size and structure indicate that they did not burrow under ground like the mole, nor climb trees like the sloth, nor dig up roots or ant hills like the armadillos and ant eaters, but loosened and cut the roots of trees with their powerful claws, and then, supported on the hind limbs and tail, pulled them down with the fore limbs aided with the great weight of the body. Like the living sloths, this species was limited in geographical distribution to South America, in the alluvial deposits of which, on the immense plains called the Pampas, their bones have principally been found. Dr. Leidy, in vol. vii. of the "Smithsonian Contributions to Knowledge" (1855), describes a North American megatherium (*M. mirabilia*, Leidy), discovered in the maritime portion of Georgia and upon the shores of Ashley river, South Carolina, in connection with bones of the elephant, mastodon, horse, and ox; it is now preserved in Washington and Philadelphia. (See MYLÖDON for comparative measurement and other interesting points.)

MEGERLE, ULRICH VON. See ABRAHAM A. SANOTA OLARA.

MEGISSEE Co., Mich. See ANTRIM.

MEHEMET ALI, or MOHAMMED ALI, pasha of Egypt, born at Kavala, a small seaport town of Macedonia, in 1769, died in Cairo, Aug. 3, 1849. He lost his father at an early age, and was brought up by the governor of the town. Soon after attaining the age of manhood he was made a collector of taxes, and by his energy and resolution in this office acquired such favor that he was made *duluk-bashi* or commander of a body of infantry, and received a rich relation of the governor in marriage. He next became a tobacco merchant, and had acquired considerable property when in 1799 he was sent to Egypt as second in command of the contingent of 800 men furnished by his native place to the Turkish army, despatched to that country to carry on the war against the French expedition commanded by Napoleon Bonaparte. Soon after his arrival he succeeded to the principal command of his corps, with the rank of *bin-bashi* or commander of 1,000 men. His ability attracted the notice of the pasha and of the soldiers, and he soon became one of the most distinguished and popular of the military chiefs of the Turkish army in Egypt. After the expulsion of the French a civil war broke out between the Turks and the Mamelukes, in which Mehemet Ali took an active part. In 1808 the Albanians in the ser-

vice of the pasha revolted because they could not get their pay, and after several conflicts in Cairo they became masters of the city, under the direction of Mehemet Ali. A long and confused struggle now ensued between various factions, the result of which was that in May, 1805, Mehemet Ali was invested with the supreme authority by the principal inhabitants of Cairo, as the only man capable of restoring order; and shortly afterward his elevation was confirmed and made legal by a firman from the sultan. But although he possessed the title of pasha of Egypt, his authority did not actually extend beyond the walls of Cairo, as everywhere in the country the Mameluke beys were still in rebellion. On Aug. 17, 1805, a considerable body of the beys, who with their followers had encamped not far from Cairo, were enticed into making an attempt to seize upon the city. They forced an entrance by a gate purposely left undefended, and marched triumphantly through the streets until they were suddenly surrounded by the troops of the pasha, who slaughtered them without mercy, a few only breaking through and escaping. The rest of the Mamelukes fled to Upper Egypt, whither Mehemet Ali pursued them with a considerable force. He had defeated them near Asiout when the arrival of a British expedition at Alexandria, March 17, 1807, consisting of 5,000 men under Gen. Fraser, who had been sent to conquer Egypt and restore the beys to power, led him to conclude a truce with the beys, and to promise to comply with all their demands if they would cooperate against the invaders. Most of them agreed to his proposals, and were marching against the British, when Gen. Fraser, who had been already several times defeated by the pasha's troops and had lost about 1,000 men, reëmbarked his army and abandoned the country, Sept. 14. Many of the beys now took up their abode in Cairo, and for 8 or 4 years Egypt was comparatively tranquil, notwithstanding occasional battles between the Mamelukes and the pasha's troops, in one of which the latter were signally beaten. At length, on March 1, 1811, Mehemet Ali enticed all the Mamelukes in Cairo into the citadel on pretence of witnessing the ceremony of investing his son Toosoon with the command of an army to be sent against the Wahabees in Arabia. The gates of the fortress were then closed upon them, and they were killed to the number of 470. Immediately afterward the pasha's officers and soldiers throughout Egypt massacred all the Mamelukes within their reach. The few who escaped fled to Nubia, where they dwindled away till the corps became extinct. These energetic proceedings, atrocious in the eyes of Christendom, but not abhorrent to the theory and practice of oriental governments, fully established the power of Mehemet Ali, and gave to Egypt an internal tranquillity unknown for ages, and which has lasted to the present time. Toosoon Pasha was now sent with 8,000 men against the Wahabees, from whom he recaptured the sacred cities

of Mecca and Medina, and whose leader he took prisoner. He subsequently met with disasters, however, and in 1818 Mehemet Ali himself went to Arabia to conduct the war. He was successful, and in 1815 returned to Egypt after concluding a treaty with the Wahabee chiefs. He now made an attempt to introduce the European system of discipline into his army; but a formidable mutiny breaking out in consequence among the soldiers, he temporarily abandoned his design. The Wahabees not having fulfilled all the conditions of the late treaty, he sent his son Ibrahim against them in 1816, with an army composed in part of the recent mutineers. The expedition succeeded in capturing El Derayah, the Wahabite capital, and in suppressing all armed opposition in Arabia to the sultan's power. Mehemet Ali now turned his attention to the improvement of manufactures in Egypt, and to the revival of the commerce of the country. He also caused the construction, at an enormous sacrifice of the laborers from sickness and want, of a great canal from Alexandria to the Nile. In 1820 his youngest son Ismael was sent with an army to conquer Sennaar, and to collect captives to be sent to Cairo with the view of forming them into an army disciplined in the European manner. Nubia, Sennaar, Dongola, and Kordofan were subdued; and although in 1822 Ismael was surprised and with his retinue burned to death by a native chieftain, these provinces have since remained subject to Egypt. The captives taken in Sennaar and Kordofan were trained by French officers, as were also many thousands of the native Fellahs of Egypt, who it was found made very good troops. In 1823 the army thus organized amounted to 24,000 men. In 1822 the pasha sent about 8,000 Albanians to assist the Turks in suppressing the Greek insurrection. He also sent his fleet, which was engaged at Navarino, and chiefly supported the contest till in 1828 the European powers compelled him to withdraw his troops from the Morea. In 1831 Mehemet Ali sent an army of 98,000 men into Syria under command of Ibrahim Pasha, ostensibly to chastise the pasha of Acre for refusing to deliver up a multitude of deserters who had taken refuge in his territories, but in reality for purposes of conquest and aggrandizement. This step brought him in immediate conflict with his suzerain the sultan, to whom he still professed allegiance. Ibrahim took Acre after a long siege, and rapidly overran Syria, defeating the Turks in a great battle at Homs, July 8, 1832. He then advanced into Asia Minor, and at Konieh on the plains of Anatolia encountered the grand vizier Reshid Pasha with 60,000 men, his own army being less than 80,000. The discipline of the Egyptians prevailed, the Turks were routed, Reshid was made prisoner, and Ibrahim was within 6 days' march of Constantinople, when the European powers intervened and compelled Mehemet Ali, in May 1833, to accept a treaty by which the whole of Syria and the district of Adana in Asia Minor were ceded

to him, beside the island of Candia, which he had formerly received for his services in Greece. The sultan was not disposed to submit quietly to the losses inflicted by his rebellious vassal; and in June, 1839, after long and vast preparation, the Turkish fleet sailed for Egypt, and an army of 80,000 men commanded by Hafiz Pasha invaded Syria. It was met by Ibrahim with 46,000 men at Nisib, June 24, and utterly routed in less than two hours. Hardly had the news of this triumph reached Alexandria when the Egyptian fleet entered the port of Alexandria, bringing with it the whole Turkish fleet, which had, through treachery, surrendered without a battle. The Turkish empire was now again preserved from total destruction by the intervention of Great Britain, Russia, Austria, and Prussia, although France, under the short ministry of Thiers, strongly favored Mehemet Ali. Alexandria was blockaded, and a British fleet bombarded and captured Beyrout and Acre. Terrified by these vigorous demonstrations, Mehemet Ali accepted terms of peace dictated by the allies, by which the pashalic of Egypt was secured to him and his descendants, on condition of paying one quarter of his clear revenues to the sultan as tribute, restoring to him his fleet and the Syrian provinces, and limiting his own army to 18,000 men. Henceforth Mehemet Ali devoted himself to the internal improvement of Egypt. The administration of the government was reformed on European models and under European advice. New systems of taxation, of import and export duties, of quarantine, and of police were introduced. Colleges for the study of languages and of medicine were established, and also printing presses, together with many minor improvements. With few exceptions all former usages were destroyed, and an entirely new system of government formed. Cotton was introduced and largely cultivated, and many extensive manufactures were created. Among the public works of utility, one of the most important was the barrage of the Nile, a vast undertaking scarcely yet complete. In 1847 Mehemet Ali for the first time visited Constantinople, where he was well received, and had the rank of vizier conferred upon him. In 1848 he became imbecile from extreme old age, and his son Ibrahim was appointed pasha in his stead; but the latter died two months afterward while his father yet lived, and was succeeded by his nephew Abbas Pasha, son of Toosoon.—An English writer, long resident in Egypt and thoroughly acquainted with the country, Mr. R. S. Poole, says of Mehemet Ali: "That he really esteemed European civilization may be doubted; but his intelligent mind could not fail to perceive that therein lay his great strength, and of this he availed himself with consummate ability. To his firm government Egypt is indebted for the profound tranquillity which it has long been its good fortune to enjoy; a traveller of any name or faith may traverse it in its length and breadth with greater security than almost any other

country out of western Europe; and the display of fanaticism has been rigorously punished. This has undoubtedly increased the hatred of the Muslims for the professors of other religions; but we may hope that it will eventually produce a better state of feeling. While, however, Egypt has benefited by the establishment of order, the people have suffered most severe exactions. The confiscation of private lands has been before mentioned; to that arbitrary act must be added the seizure of the lands of the mosques, the imposition of heavy taxation, and a system of merciless impressment. In fact, the condition of the Egyptian Fellah has rarely been as wretched as it is at the present day. He also misunderstood the real resources of Egypt, which are certainly agricultural; by the much lauded introduction of cotton he dealt a severe blow to native produce; and he did more to injure the country by endeavoring to encourage manufacturing industry, and by establishing enormous government monopolies, a measure which crushed the spirit of the agriculturists. His military and governing abilities were assuredly very great, and his career is almost unequalled in Turkish history."

MEHUL, ETIENNE HENRI, a French composer, born in Givet, Ardennes, June 24, 1768, died Oct. 18, 1817. He was of humble extraction, and having shown a strong taste for music was at the age of 16 taken to Paris, where he was instructed in dramatic composition by Gluck. He wrote 8 or 4 entire operas, but did not appear before the public as a composer until 1790, when his *Euphrosine et Coradin* was produced with great success. His *Stratonice*, which appeared 2 years afterward, established his reputation. Critics complained of a lack of graceful melodies in his operas, and of a dryness and monotony in the harmony and accompaniments. He seems to have justified this censure by the startling innovations he attempted to introduce into operatic composition, as in the opera of *Uthal*, produced in 1806, in which he excluded the violins from the orchestra; but in his *Joseph*, in 1807, he vindicated his claim to be ranked among the great composers. This opera is regarded as his *chef d'œuvre*, and has frequently been performed in England as an oratorio. He composed in all 42 operas, beside ballet music, songs for the festivals of the republic, and a variety of instrumental pieces, including the *Ouverture du jeune Henri*, which is considered an admirable specimen of descriptive music. He was an inspector of the conservatory, and, after the suppression of that institution, professor of composition at the royal school of music and declamation.

MEIBOM, a learned German family, whose most eminent members were HENRIKON (born in 1688, died in 1700), who made important discoveries in anatomy, and MARKUS (1680–1718), whose most celebrated work is *Antiqua Musica Auctores Septem* (Amsterdam, 1652). The fame of the latter procured invitations for him at the courts of Sweden and Denmark, and he officiated

ed as professor of belles-lettres in Upsal, Amsterdam, and other places. He also visited France and England, but was a person of unsteady habits, and died in penury.

MEIGS. I. A S. E. co. of Tenn., bounded N. W. by the Tennessee river; area, 215 sq. m.; pop. in 1850, 4,879, of whom 395 were slaves. The surface is hilly and the soil fertile. The productions in 1850 were 432,875 bushels of Indian corn, 72,022 of oats, 18,890 of sweet potatoes, and 17,667 lbs. of tobacco. There were 15 grist mills, 9 saw mills, 19 churches, and 2,145 pupils attending public schools. Capital, Decatur. II. A S. E. co. of Ohio, bordering on Virginia, and bounded E. by the Ohio river; area, 425 sq. m.; pop. in 1850, 17,971. It has a broken surface and clayey soil. There are mines of coal along the river, and large salt works. The productions in 1850 were 118,091 bushels of wheat, 267,404 of Indian corn, 70,550 of oats, and 44,142 lbs. of wool. There were 17 grist mills, 26 saw mills, 2 iron foundries, 7 tanneries, 87 churches, and 5,366 pupils attending public schools. Capital, Pomeroy.

MEIGS, JAMES ATKINS, an American physician and author, born in Philadelphia, July 31, 1839. He was graduated at Jefferson medical college in 1851; chosen librarian of the academy of natural sciences of Philadelphia in 1856; elected in 1857 to the chair of institutes of medicine in the Philadelphia college of medicine, and in 1859 transferred to the same chair in the medical department of Pennsylvania college, which post he now (1860) occupies. In 1857 he arranged and classified the collection of human crania in the academy of natural sciences, of which he published a catalogue. In the same year he edited Kirke's "Manual of Physiology," and contributed to Nott and Gliddon's "Indigenous Races of the Earth" an elaborate article on "The Cranial Characteristics of the Races of Men," which is a very complete general survey of human skulls in their ethnical relations. In 1858 he published "Hints to Craniographers on the Importance and Feasibility of some uniform System for the collection and promulgation of Craniological Statistics, &c.;" and in 1859 an erudite paper on a deformed, fragmentary skull, from a quarry cave in Jerusalem. Dr. Meigs has also been an active contributor to various scientific periodicals.

MEIGS, RETURN JONATHAN, an American revolutionary soldier and western pioneer, born in Middletown, Conn., in Dec. 1740, died at the Cherokee agency, Ga., Jan. 28, 1823. At the commencement of the revolutionary war he raised a company of men and marched to the American camp at Cambridge, subsequently accompanied Arnold on his expedition against Quebec, where he was taken prisoner, and after his release was commissioned a colonel in the continental army. He signaled himself by a brilliant expedition against a British post at Sag Harbor on Long island, for which he received the thanks of congress and a sword, and took a distinguished part in the capture of Stony Point

under Gen. Wayne, and elsewhere in the course of the war. In 1788 he emigrated to Ohio, and established himself at Marietta. In 1801 he was appointed by President Jefferson Indian agent of the Cherokees, among whom he passed the remainder of his life.

MEINERS, CHRISTOPH, a German historian, born in a village of Hanover in 1747, died in Göttingen, May 1, 1810. He was educated at the university of Göttingen, where in 1771 he was appointed professor of philosophy, and subsequently vice-rector. He was charged with the task of selecting professors of science and literature for the Russian colleges by the czar Alexander. Of his numerous works, the most important are devoted to the history of religion, philosophy, and science.

MEISSEN, a town of Germany, in the kingdom of Saxony and circle of Dresden, on the left bank of the Elbe, 15 m. N. W. from Dresden; pop. 8,914. It is celebrated for its manufactures of porcelain, known as Dresden china. It was founded in the earlier part of the 10th century by Henry I. of Germany, and during the middle ages figured as the seat of a margraviate, bishopric, and burgraviat of its name, or Miesia.

MEISSONIER, JEAN LOUIS ERNEST, a French painter, born in Lyons in 1815. He established himself when a young man in Paris, studied painting under Coignet, and in 1836 exhibited his first pictures, "The Chess Players" and "The Little Messenger," which attracted considerable attention by their spirited expression and miniature-like delicacy of execution. He has since that period devoted himself almost wholly to small pictures of *genre*, the subjects of which are generally similar to those selected by the old Dutch and Flemish masters, whom he more nearly approaches than any of his countrymen, or perhaps than any other living painter, at the same time that he preserves sufficient originality of manner to avoid being classed among imitators. Several of his works have been exhibited in the United States; among the best are "The Reader," "The Chess Players," which in 1841 gained him a 2d class medal of the academy of fine arts; "The Painter in his Studio," for which in 1843 he obtained a first class medal; "The Game of Piquet," "The Bowlers," "The Smoker," "Soldiers," &c. He has recently been commissioned to paint a picture of the emperor Napoleon at the battle of Solferino, and one of the emperors Napoleon and Francis Joseph at Villafranca, for which purpose he has made visits to Italy and Vienna. He has at various times painted small portraits and furnished vignette designs for illustrated books, including an edition of "Paul and Virginia." At the exhibition of 1855 he received one of the grand medals of honor, and in the following year he was created an officer of the legion of honor. His pictures bring immense prices, and his style has many imitators.

MEJERDA (anc. *Bagrañas*), a river of N. Africa, formed by the union of several streams

which rise in the Atlas mountains in Algeria, and running N. and N. E. through the regency of Tunis to the gulf of Tunis, into which it falls, 24 m. N. of the city of that name. Its whole course is about 200 m., and it is the only considerable river of Tunis. As it approaches the sea it enters a wide plain whose numerous lakes or ponds seem to have been formed by inundations of the river. Its waters are deeply colored by the soil, and the mass of sediment which it bears down has enlarged its delta and made many alterations in the coast line. Its whole lower course has changed, the ruins of Utica now standing close to its left bank, whereas in ancient times it flowed much nearer to Carthage. Its original Punic name is thought to have been Macaras.

MEKONG RIVER. See CAMBODIA.

MELA, POMPONIUS, a Roman geographer, who most probably flourished in the reign of the emperor Claudius. He was a native of Spain, and is said to have been the first Roman author that composed a methodical treatise on geography. His work is entitled *De Situ Orbis*, and consists of 8 books, which give a brief description of the whole world as known to the Romans. The text is corrupt, but the style is simple, and the Latinity pure. The *editio princeps* appeared at Milan in 1471; the best edition is that of Tzschucke (Leipsic, 1807).

MELAMPUS, in Grecian mythology, son of Amythaon by Idomene, Aglaia, or Rhodope, esteemed the first mortal who had been endowed with the gift of prophecy, and who had practised the medical art. He is said to have been the introducer of the worship of Bacchus into Greece.

MELANCHOLIA. See INSANITY.

MELANCHTHON, PHILIPP, the second leader of the Lutheran reformation, sometimes called the "teacher of Germany," born in Bretten, in the Lower Palatinate, now belonging to the grand duchy of Baden, Feb. 16, 1497, died in Wittenberg, April 19, 1560. His family name was Schwarzerd (black earth), but his uncle, the celebrated Greek scholar Reuchlin, translated it, after the literary fashion of the age of the revival of letters, into the corresponding Greek Melanchthon (sometimes written Melanthon, and incorrectly Melancthon). His parents were honest and pious, and in easy circumstances. He was educated at the Latin school of Pforzheim, and at the universities of Heidelberg and Tübingen. He distinguished himself by uncommon precocity of mind, and graduated as master of arts in 1514. He then began to lecture at Tübingen, and published a Greek grammar and editions of Aristotle and other classics. He took rank at once among the very first Greek and Latin scholars of the age. Before he had reached his 20th year (in 1516), Erasmus said of him: "My God! what expectations does Philipp Melanchthon excite, who is yet a youth, yea, we may say a mere boy, and has already attained to equal eminence in the Greek and Latin literature. What acumen in

demonstration, what purity and elegance of style, what comprehensive reading, what tenderness and refinement of his extraordinary genius!" With the study of Greek and Roman literature he combined a careful and reverent study of the Bible in the original. This, in connection with the influence of his friend and patron Reuchlin, predisposed him favorably to the great movement of the reformation, which commenced, during his residence at Tübingen, with the controversy between Luther and Tetzel in 1517. At the recommendation of Reuchlin he was called to the professorship of Greek at the rising university of Wittenberg in 1518, and thus became the colleague of Luther. Although he was subsequently called to other prominent positions in Nuremberg, Tübingen, Heidelberg, and even France and England, he preferred remaining at Wittenberg to the close of his life. He was decidedly the most popular teacher of the university, and attracted students from every direction. He had at times (as we learn from Heerbrand's *Oratio Funebris*) not fewer than 2,000 hearers, among whom were princes, counts, and barons, and heard 11 languages at his frugal table. Even Luther was not ashamed to sit at his feet. At first he lectured on classical literature, but in 1519 he was graduated as bachelor of divinity, and thenceforward devoted himself mainly though not exclusively to theology. Yet he did not properly belong to the clergy, having never been ordained; nor would he ever accept the title D.D. He never ascended the pulpit, although he frequently wrote sermons for others, and delivered in his house practical lectures on the Gospels in Latin, which were taken down by some hearers and published as sermons (*Postilla*). He was therefore a lay theologian; but as such he was of the greatest importance in that great ecclesiastical movement which makes the 16th century, next to the apostolic age, the most important period in church history. He acted a prominent part in all the leading events of the German reformation, and is inferior only to Luther and Calvin among the reformers. His constitutional modesty, gentleness, and peacefulness stand in strange contrast with the fiery contest into which he was reluctantly drawn. But, while Luther had to brace up his courage and to arm himself for the conflict, Melanchthon was admirably adapted to restrain the fiery zeal of his elder colleague, and to lend him the aid of his superior, well digested, and orderly learning. In 1519 he attended the Leipsic disputation, and defended Luther by his pen against Dr. Eck, the champion of the church of Rome. In 1521 he published the *Loci Communes*, the first system of evangelical Protestant theology, which passed through more than 50 editions during his lifetime, and was used long after his death as a text book in the Lutheran universities. At first it was but a fresh effusion of the vigorous evangelical faith in the Scriptures and the all-sufficient grace of God in Christ; but subsequently it was greatly enlarged and improved, although

it never attained the philosophical depth, logical order and precision, polished elegance, and scientific perfection of Calvin's "Institutes." In 1522 and the following years he wrote several commentaries which created an epoch at the time, but were overshadowed afterward by some of Luther's and especially by Calvin's commentaries, and are less valuable in a philological point of view than we might expect from so eminent a Greek scholar, who wrote Greek even easier than his native German. He also lent valuable aid to Luther in the translation of the Bible, which was commenced in 1522 and completed in 1534. In 1527 he visited the churches of Saxony with a view to correct abuses and to introduce various reforms. In 1529 he accompanied his prince to the diet of Spire, and helped to draw up the famous protest of the evangelical minority against the Catholic majority of the diet, which gave rise to the name Protestants. In the same year he attended the unsuccessful theological conference with the Zwinglians at Marburg. At that time he agreed with Luther's view on the Lord's supper. In 1580 he spent several months at Augsburg during the session of the diet, and wrote with unusual ability, conscientious care, calm moderation, and practical wisdom, his most important official work, the "Augsburg Confession," which was signed by the Lutheran princes, publicly read before the diet, and became by general consent the principal symbolical book of the Lutheran denomination. Soon afterward he replied to the "Refutation" of the Roman divines by the "Apology of the Confession," a work of great theological merit, and likewise of symbolical authority in the Lutheran church, though far less used and quoted than the Confession. Subsequently he made considerable modifications and alterations in the Confession, with the view to improve and to adapt it to the Reformed churches. Hence the difference between the "Altered" Augsburg Confession of 1540, and the "Unaltered" of 1580. The principal change refers to article X. on the Lord's supper, and the omission of all those words which favored the view of the corporeal presence and an oral fruition of the body and blood of Christ by all communicants. The changes were first passed by or acquiesced in, but subsequently gave rise to violent controversies. In 1536 he endeavored, with Bucer of Strasbourg, to bring about a doctrinal compromise between the Lutheran and Zwinglian views on the Lord's supper. In 1537 he signed the "Articles of Smalcald," drawn up by Luther, but added the singular proviso that he would acknowledge the supreme authority of the pope *jure humano*, if he would tolerate the freedom of the gospel; i. e., he was willing to become a semi-Catholic, if the pope would become a semi-Protestant. In all the conferences with the Roman Catholics, at Worms (1540), and at Ratisbon (1541), he was the delegate of the Lutheran party. In these conferences, and especially in the adiaphoristic controversy concerning the Augsburg and the Leipsic Interim

(1547), he incurred the censure of the more determined Protestants. His motives were always disinterested and praiseworthy; yet his constitutional timidity, modesty, love of peace, and the hope of an ultimate reconciliation of Catholicism and Protestantism, which he probably cherished to the end of his life, led him to make too many concessions, and to agree to compromises which satisfied neither party and were soon broken up. This compromising disposition, his doctrinal changes on the Lord's supper and other articles, together with various personal causes, disturbed his relations with Luther, of whose overbearing disposition and capricious humor he often complained in confidential letters to Camerarius and others. He even speaks once of a *servitus deformis* which he had to bear. Yet their friendship, based as it was on mutual esteem and affection, as well as equal zeal for the reformation, was never entirely dissolved. Luther, though often dissatisfied with Melanchthon's timidity and vacillation, never openly took ground against him; and Melanchthon, in his funeral oration on Luther, though not expressing himself with that warmth of feeling which he displayed 10 or 20 years before, called him the Protestant Elijah, and lamented his death as a great calamity for the church of Christ. From Luther's decease in 1546 to his own death in 1560 Melanchthon was the acknowledged leader of the German reformation, and was consulted by princes and universities in all important events and measures. In the mean time the Lutheran divines became more and more (and are to this day) divided between two schools, the strict old Lutherans, headed by Flacius, Amadorf, Hessus, and other violent polemics against Roman Catholics as well as Calvinists, and the more moderate, conciliatory, and progressive Melanchthonians, or Philippists, as they were generally called, after the Christian name of their leader. Melanchthon bore the violent abuse of his former friends and pupils with exemplary patience and meekness. What he lost in the confidence of the zealots for exclusive Lutheranism he gained in esteem and confidence with the Reformed churches in and out of Germany. He stood in friendly correspondence with Calvin to the last, and was invited to England. In 1551 he set out for the council of Trent as delegate from Saxony, when Maurice suddenly changed the aspect of affairs by his famous military stratagem against the emperor and dispersed the council. The peace of Augsburg in 1555 materially improved the political condition of the Lutherans, and secured to them liberty of worship within the German empire. In 1557 he attended, at the request of the emperor, the last theological conference with the Roman Catholics at Worms. He was received with great honor, but the conference ended in a complete failure, and the hope of reconciliation utterly vanished. This, in connection with the violent eucharistic or crypto-Calvinistic and other doctrinal controversies in the Protestant party, which made him so often wish

for deliverance *a rabie theologorum*, the unsparing attacks of the strict Lutheran party, and various domestic afflictions, greatly embittered the last years of his life, and broke down his weak physical frame, already exhausted by incessant study and application. Nevertheless he continued to write *responsa et vota* to the last. A few days before his death he wrote in Latin on a piece of paper on his desk the reasons which made the king of terrors a welcome messenger of peace to him, viz.: on the left side, deliverance from sin and from the acrimony and fury of theologians; on the right side, the light of eternity, the vision of God and his Son, and the full knowledge of those wonderful mysteries of faith which we can but imperfectly understand in this life. On an official journey to Leipsic in March, 1560, he contracted a cold which proved fatal. His last and greatest care and sorrow was the distracted condition of the church; his last and most fervent prayer, the unity of believers, in the words of the Saviour, that they may be perfected in one even as he is with the Father. When Peucer, his son-in-law, asked him whether he desired anything, he replied: "Nothing but heaven;" and soon afterward he breathed his last. He was buried in the principal church of Wittenberg by the side of Luther.—As a reformer, Melancthon was admirably adapted to complete Luther, and to assist him in his work. He differed from him as the quiet stream of the meadow from the wild mountain torrent, as the gentle breeze from the thunder storm, or as the gentle St. John from the fiery St. Paul. He was more a man of thought than of action, and better suited for the quiet study than the commotion of public life. Greatly Luther's inferior in strength of intellect and will, he surpassed him in scholarship and moderation of spirit. The one was the hero, the other the theologian of the German reformation. He reduced the new ideas to order and system, and commended them to literary men, while Luther powerfully impressed them upon the people. Luther was the most warlike and commanding, Melancthon the most peaceful and amiable of the reformers. The one gave free vent to his uncontrollable passions, and indulged often in the most violent and contemptuous terms; the other expressed himself always in gentle, scholarly, and courteous language, speaking in "the still small voice" after the thunderstorm had spread terror and desolation. He was modest and timid even to a fault, yet not cowardly; he lacked only the aggressive positive courage of heroic natures, but had the passive courage of self-control, self-denial, silence, and endurance. Luther stood firm as a rock against the pope and the emperor. Melancthon felt most painfully the evils of the schism, and was always ready to make any concession consistent with principle to restore peace and harmony. "If my eyes," he said on one occasion, "were a fountain of tears, as rich as the waters of the river Elbe, I could not sufficiently express my sorrow over the divisions and distractions of Christendom."

The *pax, concordia, tranquillitas ecclesie* constantly occur in his writings as the greatest desire of his heart. He was truly a man of peace in the midst of war, and a man of union in the midst of discord. He represents also the union tendency within Protestantism itself, and acted, especially in the latter part of his life, as a theological mediator between the Lutheran and the Reformed Calvinistic confession. The formal ecclesiastical union of the two churches in Prussia, Württemberg, Baden, and other German states since 1817, is to be attributed in great measure to the influence of the Melancthonian spirit, which was violently suppressed in the 17th century, but powerfully revived in the 19th. Luther has admirably characterized both himself and his friend in the following words of the year 1529: "My mind, being untrained in the liberal arts and unpolished, is constantly spitting out volumes of words. I am rough, boisterous, stormy, and altogether warlike, born to fight innumerable monsters and devils, to cut down stumps, to remove stones, to burn thistles and thorns, and to clear the wild forests; but Master Philippus (so he generally called Melancthon) comes along softly and gently, sowing and watering with joy, according to the rich gifts which God has bestowed upon him." In 1530, during the diet of Augsburg, Luther wrote to his friend: "I am somewhat weak in private matters, and you are stronger; but in public affairs you are weaker and I am stronger. You say, you could easily lay down your life, but tremble for the state of the church. I am well contented and perfectly at ease as regards the course of events, knowing that Christ is abundantly able to defend his cause." Melancthon was of small stature, and of tender, delicate frame, but had a fine blue eye and noble forehead. He married in 1520, by the strong advice of his friends, the daughter of the burgomaster of Wittenberg, and lived happily with her till her death in 1557. He called his nursery the "little church" (*ecclesiola Dei*), and was occasionally seen by visitors rocking the cradle with one hand and holding a book in the other. He cared little or nothing for money, was extremely good-natured and benevolent, and unblemished in all his moral relations.—The works of Melancthon reveal the extent of his scholarship, his rare talents, immense industry, and fine taste. They embrace a Greek and Latin grammar, editions of and commentaries on several classics and the Septuagint, biblical commentaries, doctrinal and ethical works, official documents, declamations, dissertations, responses, and a very extensive correspondence with friends and the leading men of the age. The first edition of his collected works appeared at Basel, in 5 vols. fol., in 1541; the second under the editorial care of Peucer, his son-in-law, at Wittenberg in 1562-'4; but both are incomplete. The last and most valuable edition is that of Bretschneider and Bindseil in the *Corpus Reformatorum* (28 vols. fol., 1834-'60). The life of Melancthon has been written by his friend Camerarius (1566), and in

the present century by Niemeyer, Köthe, Lederhose (Heidelberg, 1847; translated into English by Krotel), Galle (1840), Matthes (1841), and Wohlfahrt (1860). But a full and satisfactory biography, like that of Luther by Jürgens, is as yet a desideratum in German literature.—On April 19, 1860, the tricentennial celebration of Melancthon's death was held with great enthusiasm throughout Protestant Germany. At Wittenberg, where "he lived, taught, and died" (as the inscription on his house reads), the corner stone of a noble monument to his memory, to be erected at the side of that of Luther, was laid on that occasion by the prince regent of Prussia in the name of the king. The festival oration was delivered by the venerable Dr. Nitzsch of Berlin, the last surviving professor of the once famous university of Wittenberg. At the same hour the foundation of a similar monument was laid at Bretten, the birthplace of the *preceptor Germania*.

MELANESIA. See **MICRONESIA**.

MELANOSIS (Gr. *melanēo*, to become black). For a long time melanosis was looked upon as a distinct disease, and melanotic tumors formed a class by themselves. This is no longer the case, and it is now believed that melanosis (the deposit of a black pigment) may occur in any of the textures, natural or morbid. It is thus found in the lungs, in the bronchial and mesenteric glands, in the sympathetic ganglia, as well as mixed with new deposit as cancer and tubercle. The coloring matter is generally thought to be derived from the hematine of the blood. The black deposits in the air cells of miners is a mere accumulation of carbonaceous dust.

MELAS. See **ORPHISSIA**.

MELAZZO (anc. *Mylæ*), a seaport town on the N. coast of Sicily, in the province of Messina, 20 m. W. from Messina, built on a promontory which forms a spacious bay, the *Basilicium Sinus* of the ancients, affording excellent anchorage; pop. about 7,000. It is divided into two parts, one on the promontory strongly fortified, and the other at the harbor near the bottom of the bay. The exports are wine, oil, olives, and fruits of every kind. Many of the inhabitants are employed as sailors and fishermen, the tunny fishery being considerable. The plain of Melazzo, bounded by the mountains of Pelorus, is renowned for its beautiful scenery. The promontory of *Mylæ* was the scene of a victory of the Roman fleet over that of the Carthaginians in the first Punic war, 260 B. C., gained by means of the engines called *corvi*, then used for the first time. In 86 B. C. Agrippa, the commander of Octavian's fleet, defeated there that of Sextus Pompey. In 1719 Melazzo was unsuccessfully besieged by the Spanish army. On July 20, 1860, a brilliant victory was achieved at Melazzo by Garibaldi over the Neapolitans under Col. Bosco, resulting in the evacuation of the town and citadel by the latter. Fifty guns, 189 horses, and 100,000 rounds of ammunition were taken by the troops of Garibaldi; but the most important consequence of

the battle was that it opened the gates of Messina to the revolutionary forces.

MELBOURNE, the capital of the British colony of Victoria in S. E. Australia, on the banks of the Yarra-Yarra river, about 9 m. from its mouth, at the upper end of the large estuary of Port Phillip, 587 m. S. S. W. from Sydney; lat. 37° 48' S., long. 144° 58' E.; pop., including suburbs, about 140,000. The principal part of the town is on the N. side of the river, but some wards lie on the S., where South Melbourne, Sandridge, St. Kilda, and the W. part of S. Yarra are comprised within the city boundary. N. and S. Melbourne are connected by a bridge. On the N. side the chief part of the town lies in a valley with its extremities carried over two hills. The S. side is flat and swampy, excepting the sandy margin of Hobson's bay, where Sandridge stands. The streets of Melbourne are mostly laid out at right angles, wide, straight, and running the whole length or breadth of the town. They are macadamized in the centre, well drained, mostly flagged at the sides, and lighted with gas. In the original plan of the city lanes alternating with the main streets were left with the idea of their affording private back entrances to the houses situated in the former; but as the value of property increased these lanes were occupied by merchants and tradesmen, became independent streets, and form a very unsightly feature in the older part of Melbourne. If we except temporary erections of wood and iron, which were put up during the first years of the movement to the gold diggings, and which are gradually being replaced, the town is well built of brick and stone. The great number of laborers and seekers of fortune of all nations, including Germans, French, and Chinese, add considerably to the animated appearance of the city. The principal streets are constantly crowded with cabs, carts, and vehicles of every description. Collins street is the Broadway of Melbourne, and about $\frac{1}{2}$ wider than the great thoroughfare of New York. Melbourne became the seat of a bishop in 1847 (in 1860, Charles Perry, D.D.). The most numerous churches are those of the church of England, Wesleyans, and Roman Catholics, and there are also places of worship for Independents, Lutherans, Baptists, and other Protestant denominations, as well as for Jews. The new Wesleyan church, opened in Aug. 1858, is said to be one of the handsomest church edifices belonging to that denomination in the world. The city contains 9 banks, 8 theatres and a circus, an exchange, a court house and public offices, a very substantial market place, a government house, a great number of handsome shops and warehouses, beside many very elegant private residences. The exterior of the new parliament house is not yet completed. The cost of the building, when finished, will not be much below £1,000,000. There is a hospital for both in and out door patients, a benevolent and lunatic asylum, and other charitable institutions. The university of Mel-

bourne was opened April 18, 1855. It is built from the designs of Mr. F. M. White, upon a fine site to the N. of the city, and has 40 acres of land attached, forming part of extensive pleasure grounds. The form of the building is that of a parallelogram, the 4 sides facing the cardinal points, with a quadrangle in the centre. It is open to all classes of British subjects without any religious tests. It has professorships for the classics, mathematics, modern history, and natural science. The number of national and private schools in 1860 was upward of 200, and is constantly increasing. There are also scientific and literary associations, and the public library is among the finest public buildings; its large hall is supported by Corinthian columns and paved with tessellated marble. The average attendance is 200 daily. Another wing is to be added to it, and the colonial government has granted £20,000 for that purpose. The number of books is about 8,000. The legislature voted in 1859 and 1860 respectively £5,000 for the purchase of new books. The principal journals are the "Age," "Herald," and "Argus." The new post office, opened in 1859, is a magnificent building in the Italian style, elaborately adorned with sculptures; it stands on the corner of Bourke and Elizabeth streets. The principal façade, which is on Bourke street, is broken by 4 towers; and in one of the corner towers, which rises a story higher than the others, there is a clock with 4 dials. The Yan Yean water works were opened Dec. 31, 1857, being the greatest engineering works in which the colony of Victoria ever engaged. The reservoir is formed in a valley among the Plenty ranges, by confining the water of the river by an embankment 3,159 feet long, 81 feet high, 170 feet in thickness at the bottom, and tapering to only 20 feet at the top. The inside of this embankment is a wall 30 feet thick at the bottom and 10 at the top. From this lake the water is carried through iron pipes to Melbourne, a distance of about 18 m. The lake is 25 feet deep and 10 m. in circumference. The valve house in Carlton gardens allows the water to flow direct into all parts of the city. There are several pleasure grounds in the immediate neighborhood of the city, the chief of which are the royal park, the police paddock, and the Carlton and Fitzroy gardens. Collingwood, Brighton, Richmond, St. Kilda, and other suburbs of Melbourne are studded with beautiful villas and terraces. The number of houses given in 1857 is 10,384, at the average yearly rental of \$450 for each house.—There is a steam mail service established with England, *via* the isthmus of Suez, once a month, and regular communication is maintained with all the neighboring colonies by very efficient steam vessels. Good roads extend to all the principal gold fields; there is a railway to Geelong, and several other railways are in course of construction to bring the produce of the far interior to Melbourne. The climate is on the whole cooler than is generally experienced in

the same latitude N. The mean temperature of January (midsummer) is 66°, the highest 101°, and the lowest 48°; while the daily average of the month is 19°. There is a great proportion of dry sunny weather. The annual fall of rain, taken from the mean of 5 years, gives 32.63 inches. The wettest months are those from April to November inclusive.—In commerce Melbourne ranks as the first port in the British colonial possessions and of the southern hemisphere. This importance is due to the gold discoveries in 1851. The trade of Melbourne is carried on with all the principal ports of the world, and the imports consist, with trifling exceptions, of every article of necessity or luxury used by civilized man. Beside gold, the chief exports are wool, tallow, hides, and other kinds of raw produce. Gold is in proportion to the other exports about $\frac{1}{4}$ of the whole amount. The exports of Melbourne in 1856 amounted to £14,868,250. The total value of the trade, both export and import, was in 1857 about £31,000,000; and the vessels entering the port measured in the aggregate 800,000 tons. During the 8 months ending March 31, 1859, the imports amounted to £3,880,640 (declared value), and the exports to £3,279,288; and during the same period in 1860 the imports were £4,046,584, and the exports £2,992,105. The export of gold from Melbourne for the last 5 years has been as follows: 1855, 2,576,745 oz.; 1856, 3,008,811; 1857, 2,729,655; 1858, 2,586,988; 1859, 2,280,525. The receipts at the Melbourne custom house for the year ending March 31, 1859, amounted to £2,961,265, and for the year ending March 31, 1860, to £3,261,148. The commerce of the United States with Melbourne comprised in 9 months ending June 30, 1858, an aggregate of 90 vessels. Ships drawing 24 feet of water can come up Port Phillip as far as Hobson's bay at the mouth of the Yarra Yarra; but vessels requiring more than 9 feet of water cannot get over the bars. Although the distance to the bay by the course of the river is 9 m., it is not quite 2 by land, and a railway with an extensive jetty at its lower terminus has been made, connecting Melbourne with Port Phillip at Sandridge. There is another railway to Williamstown, on the opposite side of Hobson's bay, which, though considerably longer, has the advantage of better shelter for ships lying at the jetty. A ship railway has been constructed here capable of taking up vessels of very large size. From the anchorage in Hobson's bay to the Heads of Port Phillip the distance is about 85 m., and the channels are obstructed part of the way by sand banks which render the assistance of experienced pilots necessary. The Heads, or the opening connecting Port Phillip with Bass's strait, is about 2 m. across, but this is occupied by foul ground on either side, which leaves a channel for shipping of little more than a mile broad. Through this narrow passage the ebb and flood tides sweep over the uneven bottom with great force, and raise a sea which, when

the wind happens to be fresh from the opposite direction, is exceedingly dangerous and often fatal to small or dull-sailing craft. Strong fortifications are at present in course of construction upon the points of land, Lonsdale and Napein, at either side of the entrance. The rise and fall of the tide is about 8 feet. Melbourne possesses steam flour mills, tallow boiling establishments, brass and iron foundries, and other industrial establishments.—The site of Melbourne was selected and occupied by a small colonizing party from Tasmania, or Van Diemen's Land, in 1835. Two years afterward the town was officially recognized and named in honor of Lord Melbourne, the British prime minister, by the government of New South Wales, to which colony Melbourne, together with the surrounding country, then called the Port Phillip district, belonged until its formation into a separate colony in 1851 under the name of Victoria. In 1852 Melbourne became the seat of a legislative assembly.

MELBOURNE, WILLIAM LAMB, viscount, a British statesman, born in London in 1779, died Nov. 24, 1848. He was the eldest son of the first Viscount Melbourne, and after an education at Trinity college, Cambridge, and the university of Glasgow, was in 1804 called to the bar at Lincoln's Inn. In 1805 he entered parliament as a supporter of Fox and the whigs, a connection which he steadily maintained during his political life. In 1812 he was returned for Westminster, and in 1827 was appointed secretary for Ireland. In 1828 he succeeded to his title, and took his seat in the house of lords, and two years later he entered the cabinet of Earl Grey as home secretary. Upon the retirement of the latter in 1834 he became the first lord of the treasury, in which position he remained, with the exception of a brief period in 1834-'6, when Sir Robert Peel temporarily assumed the premiership, until 1841, when he was again succeeded by Peel. His administration was distinguished by no important political event, but was rendered permanent and popular by the tact and personal qualities of the premier.—CAROLINE (PONSONBY), known as Lady Caroline Lamb, wife of the preceding, born Nov. 13, 1785, died in London, Jan. 26, 1828. She was the only daughter of the 8d earl of Beesborough, and at 20 years of age, being then remarkable for her grace of manners, intellectual culture, and genius, was married to the future premier, who was then just commencing his political career. Having tastes congenial with those of her husband, she shared with him the classical studies in which they were both proficient, and also made herself mistress of several of the modern languages. In 1816 she appeared before the public as the authoress of "Glenarvon," a novel of which the hero was supposed to shadow forth the character and sentiments of Lord Byron, for whom about 1818 she had conceived a romantic but unfortunate attachment, which was long the theme of comment in fashionable circles in London. The poet, wearying

finally of her admiration, severed his relations with her in the well-known lines to her written a short time before his departure from England. Notwithstanding this attack, she still cherished feelings of regard for him; and it is related that, coming suddenly upon the hearse which was conveying the remains of Byron to Newstead abbey, she fainted on the spot, and was for some time afterward prostrated by a severe illness. For many years she lived in seclusion in Bocket hall, and about 8 years before her death was separated from her husband, who however continued to visit and correspond with her, and of whom she never spoke but in terms of admiration. She published two other novels, "Graham Hamilton" and "Ada Reis."

MELCHISEDEK ("king of righteousness"), according to Gen. xiv. 18, a "priest of the most high God" and "king of Salem," went forth to meet Abraham on his return from the pursuit of King Chedorlaomer, brought "bread and wine" for the warriors, and blessed Abraham, who in return gave him a tenth of the spoils. One of the Psalms (cx. 4) contains the words, "a priest after the order of Melchisedek;" and the Epistle to the Hebrews (vi. 20, vii. 1-22) represents him as a type of Christ, and his office as superior to the Aaronic priesthood. The opinions of theologians as to the person of Melchisedek and the nature of his priesthood have at all times greatly varied. With regard to his residence, they are now generally agreed that Salem was the original of Jerusalem. In the ancient church, a sect, called Melchisedekites, regarded Melchisedek as an incarnation of a divine power, and as superior to Christ.

MELOTHAL, ARNOLD VON, a Swiss patriot, born in the canton of Unterwalden in the latter part of the 18th century. His real name was Arnold von der Halden, but he was generally known by the name of Melchthal, in which place he resided. The servant of the Austrian governor Von Landenberg having one day seized a yoke of oxen belonging to Arnold's father, the young man struck the menial to the ground and fled to the mountains. His father, declining to disclose his place of refuge, was blinded by order of the governor; and this cruel deed, which has been beautifully dramatized in Schiller's "William Tell," became the signal of revolution. Young Melchthal, in his retreat on the Rütli, was joined by Fürst of the canton of Uri and Stauffacher of the canton of Schwytz, with whom, one night in Nov. 1807, on the shore of Lake Lucerne, he took an oath to devote his life to the cause of Swiss independence, which was achieved in Jan. 1808, by the expulsion of the Austrians from the 8 cantons above named, and the destruction of their castles, without bloodshed. The authenticity of the whole account, however, which is given according to an ancient Swiss chronicle, has been much disputed of late years. Arnold von Melchthal has sometimes been confounded with Arnold von Winkelried, another Swiss hero, who fell at the battle of Sempach, July 9, 1386.

MELCOMBE, LORD. See DODINGTON.

MELEAGER. I. A mythical hero of Greece, and one of the Argonauts. II. A Macedonian general who served under Alexander the Great. At the battle of the Granicus, 334 B. C., he commanded one of the divisions of the phalanx; and in almost all the Asiatic campaigns he appears to have held the same office. On the death of Alexander he was associated in the regency with Perdicas, but was subsequently put to death by order of his colleague. III. A Greek epigrammatist, who flourished about the middle of the 1st century B. C. He was a native of Gadara in eastern Palestine, and made a collection of epigrams, entitled *Στεφανος Επιγραμματων*, from over 40 authors. This work has perished, but we still possess 131 of his own epigrams, which form part of the Greek anthology. The best separate edition of Meleager is that of Gräfe (Leipsic, 1811).

MELEGNANO, **MARIGNANO**, or **MARIGNAN**, a town of Lombardy, in the district of Milan, on the Lambro, 11 m. S. E. from Milan and 10 m. W. N. W. from Lodi; pop. about 4,000. It was destroyed by the emperor Frederic II. in 1239; and the Guelphs and Ghibellines signed a treaty of peace there in 1279.—In Sept. 1515, it was the scene of a famous battle between Francis I. of France and the Swiss in the service of the duke of Milan, which is sometimes called, from its obstinacy and the superior character of the troops on both sides, the "battle of the giants." The attack was made by the Swiss late in the afternoon of the 13th, with such impetuosity that the French were driven from their intrenchments and lost a part of their artillery. Rallying, however, under the inspiring conduct of the king, they soon recovered their ground and maintained the contest until the night was far advanced. A truce then ensued for a few hours. At the dawn of day the battle was resumed, the Swiss again being the assailants; but their charge this time was repelled with unshaken firmness, and Francis at the head of his men-at-arms then threw himself upon their line, and for a while caused it to waver. It may be doubted, however, whether he would have proved the victor had not D'Alviano rushed into the midst of the fight with a small body of cavalry, and shouting the war cry of *Marco* animated the French with the belief that their Venetian allies had come to their assistance. The Swiss, after supporting the contest for several hours, withdrew to Milan, but in such order that the conquerors did not venture to pursue them. The losses are variously stated—that of the Swiss from 8,000 to 15,000; that of the French from 3,000 to 8,000. The chevalier Bayard distinguished himself on the field by feats of extraordinary bravery; and Francis, who throughout the action had given many proofs of courage, insisted upon being knighted by him on the spot.—Another French victory was gained here, June 8, 1859. On the occupation of Milan by the French and Sardinians after the battle of Magenta, the Austrians re-

treated toward Lodi, holding Melegnano with about 18,000 men in order to cover their line of march. The emperor Napoleon ordered Marshal Baraguay-d'Hilliers at the head of the 1st army corps, assisted by the 2d corps under Marshal McMahon, to dislodge them; and in accordance with these instructions McMahon's troops advanced in two divisions in such a manner as to turn the position, while Baraguay-d'Hilliers, with his men disposed in 8 columns, marched along the main road. On reaching the town he found the Austrians posted behind a barricade with a battery planted on an eminence which commanded the approach, and riflemen in nearly every house. The artillery began the battle and played for about an hour, when a battalion of Zouaves, followed by the whole 1st brigade, charged upon the Austrians and drove them into the town. Here a desperate hand-to-hand conflict was maintained from 7 till 9 o'clock in the evening, ending with the complete rout of the Austrians. Marshal McMahon's corps arrived in time to inflict great loss upon the retreating enemy, but the victory was followed by no important result. The French, by their own account, had 16,000 men in the field, and lost 943, while the Austrians lost 2,300.

MELENDEZ VALDEZ, **JUAN ANTONIO**, a Spanish poet, born in Ribera del Fresno, Estremadura, March 11, 1754, died in Montpellier, France, May 24, 1817. He was educated at the university of Salamanca, where he became professor of belles-lettres. In 1780 he obtained a prize offered by the Spanish academy for the best eclogue, on which occasion he had Yriarte for a rival. He afterward held various official stations, and when Joseph Bonaparte became king of Spain, attached himself to the French party, and shared in its misfortunes. Once he was led out to be shot by the populace of Oviedo, whither he had been sent as a commissioner. Finally he fled to the south of France, where he lived for 4 years in misery, his death having been hastened by the want of means to purchase substantial food. His poems embrace odes, eclogues, idyls, and pastoral dramas, of which the most popular is "Camacho's Wedding." His collected works, with a life by Quintana, were published at Madrid in 1820.

MELETIUS, or, as Athanasius and others call him, **MELITUS**, bishop of Lycopolis in the Egyptian district of Thebais, flourished about the beginning of the 4th century. He disagreed with Peter, bishop of Alexandria, concerning the readmission of the *lapsi* to the church, and encroachments upon the rights of other bishops, especially that of Alexandria. The accounts given by ancient writers of the origin and nature of this controversy are very contradictory, and the church historians are not yet agreed what part of the ancient account should be taken as true, and what part ought to be rejected. It is generally admitted that the Meletian schism arose between 303 and 305. The council of Nice censured Meletius, and forbade him to ordain any priests in future; but

the title of bishop was left to him, and those who had been ordained by him were permitted to retain their offices. At the time of the council of Nice the party of Meletius counted 29 bishops, and in the city of Alexandria itself it had 4 priests and 8 deacons. The hope of the council to bring the Meletians back to a union with the Catholic church was not fulfilled. They soon after united with the Arians against Athanasius, and are mentioned as late as the middle of the 6th century.

MELETIUS, bishop of Antioch, born in Melitene, Armenia Minor, about the beginning of the 4th century, died in Constantinople in 381. Little is known of his early life. He was first bishop of Sebaste, which see he resigned on account of the stubborn conduct of the people. He then lived in retirement at Bercea (according to another statement he was bishop there) until 360, when he was elected bishop of Antioch. That church was greatly disturbed by the Arian controversy. The bishop Eustathius, an adherent of the council of Nice, had been deposed in 380 through the influence of the Arians. His followers existed as a separate party, under the name of Eustathians, while the Arians were themselves divided, the ruling party, which was on the whole Arian, in opposition to Semiarianism, bearing the name of Acasians. Meletius was so highly esteemed, that he was elevated to the episcopal see by general consent. Yet soon after his inauguration he offended the Acasian party by a discourse, which, though it did not adopt the Athanasian expressions, yet leaned toward the orthodox (Nicene) party. Meletius had to leave Antioch, and a strict Arian, Euzoios, was elected in his place. But one portion of the diocese adhered to Meletius and seceded. This new organization, the Meletians, held a synod at Antioch in 383, at which they adopted the doctrines of the council of Nice, though only with an explanatory clause. Notwithstanding this advance toward the orthodox churches, the old Nicene party of the Eustathians continued its separate existence and was alone recognized by the western churches, in particular by Alexandria and Rome. Repeated efforts of Meletius to obtain his recognition by Rome failed, but in 380 his jurisdiction over all the Arian churches was restored. The connection of Meletius with the leading theologians of the eastern church, as Basil, Gregory of Nyssa, and others, gradually prepared the way for his recognition by the Nicene churches and for a compromise with the Eustathians. Meletius, instead of Paulinus, bishop of the Eustathians, appeared at the oecumenical council of Constantinople as the representative of Antioch; he was even regarded as one of the leading men of the council, and died before its close. After his death, the schism between the Meletians and the Eustathians continued. In 398 the successor of Meletius was recognized by Rome and the West; and in 415 the last members of the Eustathian sect joined the predominant church.

MELLI, GIOVANNI, a Sicilian poet, born in Palermo, May 4, 1740, died there, Dec. 30, 1815. He was a physician and professor of chemistry at the university of Palermo, and was the author of several scientific essays; but he is chiefly celebrated for his poetical compositions, which have procured him the titles of "the Sicilian Anacreon" and "the modern Theocritus." His love songs are extremely popular in Sicily. The most important of his poems, beside his odes and eclogues, are: *La fata galante*, his earliest effusion; *Don Chisciotte*; and *Origine del mondo*, a philosophical satire. A complete edition of his poetical works, edited by himself, appeared at Palermo in 1814, in 7 vols. 8vo.

MELITA. See MALTA.

MELLEN, GREENVILLE, an American poet, born in Biddeford, Me., June 19, 1799, died in New York, Sept. 5, 1841. The eldest son of an eminent chief justice of Maine, he was graduated at Harvard college in 1818, studied law in the office of his father, who had removed to Portland, was admitted to the bar, married, and removed in 1828 to the neighboring village of North Yarmouth, where he engaged in the practice of his profession. He had been a frequent contributor of verses to magazines and annuals, when in 1826 he pronounced in Portland before the peace society of Maine a poem on the "Rest of Empires." In 1827 he published a satire entitled "Our Chronicle of Twenty-Six," in 1828 delivered an anniversary poem before the Athenæan society of Bowdoin college on the "Light of Letters," and in 1829 collected from his prose contributions to periodicals a volume entitled "Glad Tales and Sad Tales." His principal collection of poems, entitled "The Martyr's Triumph, Buried Valley, and other Poems," was published at Boston in 1833. The "Martyr's Triumph" is in the Spenserian stanza, and is founded on the history of St. Alban; the "Buried Valley" describes the avalanche near the notch in the White mountains by which the Willey family was destroyed. Mr. Mellen resided about 5 years in Boston, and removed thence to New York, where in 1839 he began a "Monthly Miscellany," which was discontinued after a few numbers. His health was always feeble, and he died of consumption after a voyage to Cuba in 1840.

MELLONI, MACEDONIO, an Italian physicist, born in Parma in 1800, died of cholera in Portici, near Naples, Aug. 11, 1854. He first became professor of natural philosophy at the university of Parma, where between 1824 and 1831 he taught hygrometry. Political events having compelled him in the latter year to expatriate himself, he took refuge in France, and was appointed through the efforts of Arago a professor in the college of Dôle, in the department of the Jura. Repairing thence to Geneva, he availed himself of the collection of scientific instruments of Prevost and De la Rive to make several important discoveries respecting the radiation of heat, which he presented in 1833 to the French academy of sciences. His commu-

nication was received coldly by that body, but the discoveries which it embraced subsequently procured him the Rumford medal from the royal society of London. Having now taken a prominent place among European physicists, he was enabled through the influence of his friends Arago and Humboldt to return to Italy, and was appointed by the king of Naples director of the meteorological observatory then building on Mt. Vesuvius. Among the results of his labors at this institution was the discovery of heat in lunar light, which led to the determination of the analogy of radiant heat to light. Political troubles again interrupted his labors, and for his presumed sympathy with liberal principles he was in 1849 ejected from his post, and retired to a villa in the neighborhood of Portici. In 1850 he published the first volume of a work entitled *La termocrasi, o la colorazione calorifica*, containing an account of his theory of the "coloration of light," and of his experiments on the diffusion of heat by radiation, and particularly of its transmission through transparent media. Subsequently he gave much attention to the study of electricity, and combated the conclusions of Faraday with regard to the transmission of currents over submarine wires.

MELMOTH, WILLIAM. I. An English lawyer and author, born in London in 1666, died there in 1748. He was called to the bar in 1693, and appears to have been treasurer of Lincoln's Inn in 1730. He is chiefly known as the author of "The Great Importance of a Religious Life Considered," of which over 100,000 copies were sold during the 18th century. This treatise was first published anonymously, and was for some time attributed to John Percival, earl of Egmont. A new edition of it, with a memoir of the author, by Charles P. Cooper, was privately printed in London in 1849, and presented to the benchers of Lincoln's Inn. II. A scholar and author, son of the preceding, born in London in 1710, died in Bath, March 15, 1799. Though educated for the bar, the greater part of his life was passed in retirement. In 1742 he published 2 volumes of "Letters on Various Subjects," under the pseudonyme of Sir Thomas Fitzosborne. His other principal works are translations from Pliny and Cicero.

MELO, or MELLO, FRANCISCO MANUEL DE, a Portuguese and Spanish author, born in Lisbon, Nov. 28, 1611, died there, Oct. 18, 1666. He was educated for literature, but entered the army at an early age, attained the rank of colonel, and when the insurrection against Philip IV. broke out in Catalonia was sent thither, receiving a royal order to write the history of the war. This work, *Historia de los movimientos, separacion y guerra de Cataluña* (Lisbon, 1645), ranks as a classic in Spanish literature. Melo was in the great tempest of 1627, when the Portuguese fleet was wrecked and thousands were lost; for 12 years he was confined in a Portuguese prison under a false accusation of murder, and for 6 years was an exile in Brazil. When in 1640 Portugal was

separated from Spain, he entered the Portuguese service, and was employed in diplomacy. After returning home in 1648, he devoted himself to literature. Many of his works in Spanish and Portuguese are unpublished; but those already printed exceed 100 volumes. His most popular poems are embraced in the *Tres musas del Melodino* (Lisbon, 1649; Lyons, 1665).

MELODEON (Gr. *melodia*, melody), the name, at different times, of two or more unlike forms of musical instruments, but now appropriated to one of recent date, and so far excelling those before it as to be substantially a new invention. In this, externally resembling the piano, the notes are determined by touching the keys of a finger-board; each key, lifting a valve, allows a current of air from a bellows, worked meanwhile by the foot on a pedal, to agitate the corresponding one of a series of metallic free reeds; the compass is 5 to 7 octaves. The rocking melodeon, known in America since about 1825, was unsightly, tardy in sounding, and of harsh tone. Mr. Jeremiah Carhart (born in Dutchess co., N. Y., in 1815) conceived the plan of acting on the reeds by suction instead of blowing, and reversed, to this end, the bellows and reeds, inventing the present instrument in 1886. He thus secured prompt sounding, and a flute-like quality of tone; "voiced" the note by curving the reeds; and made many other improvements. In 1859, 22,000 of these instruments were manufactured in the United States.

MELON, the common name of the fruit of creeping vines, distinguished generally as muskmelons, watermelons, and citrons, originating, as it is supposed, in the East, and long cultivated both in warmer climates and in those where artificial heat is requisite to bring it to maturity. In the former the melon supplies the want of vegetation during the period of the year when other plants possessing cooling properties are disappearing on the approach of the intense summer heats; and in the latter, as for instance in England, the melon is brought to great perfection by hotbeds and similar artificial appliances to maintain the temperature it requires. The melon succeeds admirably in some portions of the United States; and even in the vicinity of Boston it arrives at perfection in ordinary seasons. According to Lindley, its leaves have an immense perspiratory power, so that they require a greater supply of fluid than those of most other plants; which accounts for the singular fact that the melon seems to thrive best when its roots find their way into water, as in the irrigated fields of Persia, in the floating islands of Cashmere, and the springy river beds of India. Such a supply of moisture is requisite under exposure to an intense sunshine, the heat and bright light of which decompose and alter the fluids of the plants and elaborate from them an abundance of sweet juices. Artificially treated thus, the result was a failure; and only by repeated experiment did Knight succeed in raising in England the sweet melons of Ispahan to a perfection hitherto unsurpassed. He discovered

that the moisture should be applied to the roots so as not to cool the surface of the soil in which they grew, and for this end the ground was covered with tiles between which the water was poured. Such precaution, with high artificial heat and strong light, rendered his efforts successful. The frequent thunder showers and the summer heat combined produce the same effect in the American climate.—The term melon is applied to the many varieties of one species, the *cucumis melo* of botanists, ranging from the soft, mealy-fleshed, and almost tasteless smooth-rinded muskmelon, of an elongated form, through the richly flavored cantaloupes of the same general form, to the delicious green-fleshed, globular kinds, with rough netted rinds, known under different local names, in which the flesh is more firm, fibrous, rich, and highly flavored. The cantaloupes, such as the netted and black or rock cantaloupe, are much esteemed; and the sort to which they are naturally allied is said to have originated from a place of that name about 15 miles from Rome, where melons have been cultivated since the time of the Mithridatic war, and to have been originally brought from Armenia by Lucullus. According to Burnett, this particular sort is now unknown there. Next to these come the Persian varieties, such as are cultivated to an unsurpassed perfection on the plains of Ispahan and in Bokhara. The tendency to "sport" or run into new forms by intermixture, makes it difficult to classify the melons; and the London horticultural society's catalogue declares that it is not easy to fix upon any permanent characters. In the arrangement used by that treatise, the season or period of ripening, the quality of bearing, color and thickness of the rind, color of the flesh, and average weight of the fruit when well grown, are the characters employed. Cultivators and amateurs in America are not well agreed on the merits of varieties cultivated. Kenrick, in his "New American Orchardist" (Boston, 1835), enumerates about 80 kinds as particularly good. Downing, in his "Fruits of America" (New York, 1845), has made a simple arrangement of them into 3 classes, viz.: green-fleshed, yellow-fleshed, and Persian. He gives only 13 varieties as among the choicest kinds. The skill of the cultivator produces occasionally some new or superior sort.—The melon, muskmelon, or cantaloupe, has a prostrate, hirsute, annual stem; cordate-orbicular, somewhat angular and roughish leaves, borne upon petioles 2 or 3 inches long; axillary, shortly peduncled, yellowish flowers; oval or ovate-globular, longitudinally ribbed fruit; and simple tendrils. It belongs to the natural order *cucurbitaceae*, which are tropical plants in respect to habitat, though adapting themselves under cultivation, like many other annuals, to a more temperate climate. Excellent as are the fruits of the melon, yet as a genus *cucumis* possesses the prevailing characteristics of deleterious qualities. Many valuable medicines are the products of species of these cucurbitaceous plants. In the United States the

climate most favorable to the melon is that of the middle and southern states. In these, melons can be raised as field crops; and in warm, dry soils, such as that of Long island and New Jersey, the product may be so large that even at low prices the crop is one of the most profitable. Except in the most northern states, the cultivation of the muskmelon and of its varieties is very easy. The fruit of the muskmelon is considered cooling and refreshing, though with some it proves difficult of digestion and liable to produce colicky symptoms. The green-fleshed varieties are generally the sweetest and most delicious, and can be eaten with the most impunity. A particular variety called the nutmeg, when pure and in perfection, is very excellent, melting, and has a very high musky flavor. Downing especially commends the Persian melons as being in this respect exquisite. They require, however, extra care to bring them forward, and the employment of the hotbed to hasten the growth of the plants in the spring. Beside the above mentioned, there is a melon called *dampaha*, cultivated in the East, and which has the property of keeping for a long time after being cut, if suspended in a dry warm room, and hence known in the south of Europe as the winter melon.—The watermelon (*citrullus vulgaris*, Schrader) was once considered a species of *cucurbita*, then transferred to *cucumis* by De Candolle, but now made a distinct genus. It belongs, however, to the same natural order, and possesses the same essential characters, being an annual, trailing, rather slender plant, branching somewhat, and extending its stems from 8 to 15 feet in length; its leaves are 5-lobed, ovate in outline, 8 to 6 inches long, borne on petioles 2 to 3 inches long; its tendrils are branched; its flowers axillary and pale greenish yellow; its fruit of a very large size, smooth and green, with a red or yellow core and black or reddish brown seeds. The cooling and refreshing juice with which it abounds renders the watermelon a universally favorite fruit for the hotter season of the year, when it occurs in perfection; and immense fields are devoted to its production in New Jersey and Long island, the mode of culture being the same as that of the muskmelon. About Boston it does not prove a difficult fruit to raise, ordinarily requiring rich, dry, and light soil, and some little care in planting. There are many varieties, some of which are most highly esteemed, such as the imperial, a productive sort from the Mediterranean, with fruit nearly round, rind remarkably thin, flesh solid to the centre, light red, crisp, and rich; the Carolina, a large common variety, with very large, oblong fruit, flesh of a deep red, hollow at the centre, seeds very black, of which a sub-variety with pale yellow flesh and white seeds is known; the Spanish, a rich excellent kind, with large oblong fruit, skin very dark, blackish green, somewhat marbled, flesh red, solid, rich, and sweet; and the mountain sweet, a sort in much repute among cultivators.—The citron, so called, is a

nearly allied plant, with leaves, stems, and fruit so closely resembling the watermelon that judging from external marks there is nothing to distinguish it. The fruit is, however, round in shape, the rind of a dark green, mottled with large irregular whitish spots, the flesh of a tough hard consistence and tasteless, the seeds black. It is employed in the making of sweetmeats and preserves, by removing the rind or skin and seeds, cutting the flesh into convenient bits, and boiling in sirup which has been flavored with ginger, lemon, or some agreeable article. Dr. Darlington conjectures that it may be the particular variety of the watermelon known as the *pasteca* of Seringe and De Candolle. Its cultivation is the same as that of other kinds of melons, and it is a common plant in gardens.

MELODRAMA. See **DRAMA**, vol. vi. p. 609.

MELODY. See **MUSIC**.

MELOS. See **MIL**.

MELPOMENE, in Grecian mythology, the muse who presided over tragedy. She was a daughter of Zeus and Mnemosyne, and is generally represented as a young woman of grave countenance, arrayed in splendid garments, wearing the cithurnus with a wreath of vine leaves on her head, and having in one hand a sword or the club of Heracles, and in the other a crown or sceptre.

MELROSE ABBEY, a celebrated ruin, situated on the Tweed in the town of Melrose, Roxburghshire, Scotland, 87 m. from Edinburgh, and 32 S. W. from Berwick. It was founded in 1136 by David I., completed in 1146, and dedicated to the Virgin Mary, the first occupants being Cistercian monks, who were brought from Yorkshire in England. In 1322 it was destroyed by the English army of Edward II. retreating from a fruitless invasion of Scotland, but was soon after rebuilt by Robert Bruce substantially after the present design, and in a style of magnificence which ranks it among the most perfect ecclesiastical structures of the best age of Gothic architecture. In 1385 and again in 1545 it suffered severely at the hands of invading English armies; and during the period of the reformation, when its monks were scattered, its choicest sculptures were wantonly mutilated by iconoclastic zealots. In later times it has been despoiled of many of its stones to furnish materials for the construction or repair of other buildings. Notwithstanding the ravages of time and the destructive efforts of man, it remains at the end of 5 centuries one of the best preserved specimens of Gothic architecture in Great Britain; and so durable is the stone of which it is built that the most delicate ornaments wrought in it appear as sharply defined as if newly carved. The church, which is the only part of the ancient monastery remaining, stands in the midst of a wide and fertile landscape, renowned in border legend and song, and is built in the form of a Latin cross, 285 feet by 180, with a square tower 84 feet high in the centre, of which only the W. side and part of the N. and S. walls are standing. The pres-

ent entrance is by a magnificent Gothic portal in the S. transept, over which rises a window 24 feet in height by 16 in breadth, divided by 4 richly interlaced mullions, and surmounted by niches which formerly contained statues of Christ and the apostles. Other parts of the same transept are ornamented with sculptured forms of plants, animals, and men. In the S. wall of the nave are 8 small chapels, lighted by as many windows of exquisite design, and of which the 3 nearest the central tower retain their original Gothic roof, the remainder being roofless. On the E. side of the choir or chancel is a window in an excellent state of preservation, than which, says Sir Walter Scott, "it is impossible to conceive a more beautiful specimen of the lightness and elegance of Gothic architecture when in its purity." Other portions of the building still standing, such as the cloisters and parts of the aisles, exhibit the richest fancy in their tracery and adornments, the forms of leaves and stalks being so delicately carved that a straw can be thrust between their interstices. Within the walls of the abbey lie buried Alexander II. of Scotland, James, earl of Douglas, who fell at Otterburne, and many warriors of the house of Douglas, of Scott of Buccleugh, and of other famous border families. Here also, according to tradition, was deposited the heart of Robert Bruce, after the "good Lord James" Douglas had made his unsuccessful attempt to convey it to the Holy Land. Over the whole structure a halo of romance has been thrown by the genius of Scott, who passed his latter years at Abbotsford, 3 miles distant, and whose description of the abbey by moonlight in the 2d canto of the "Lay of the Last Minstrel," is one of the finest passages in the poem. For upward of a century and a half the abbey has been in the possession of the earls and dukes of Buccleugh, who in 1816 temporarily fitted up a portion as a parish church.

MELTON-MOWBRAY, a town of England, in Leicestershire, near the confluence of the Eye and Wreak, 16 m. N. E. from Leicester, and 105 m. N. N. W. from London; pop. in 1851, 4,391. It is the centre of a hunting district, and the seat of the Melton club, which meets here from November to March, and attracts such numbers of sporting characters, that stabling has been erected for over 800 horses. The royalists defeated a body of republicans here in 1644.

MELUN, capital of the French department of Seine-et-Marne, on the Seine, 28 m. by railway from Paris; pop. of the town in 1856, 7,050; of the arrondissement of Melun, 62,164. The principal manufactures are cotton, wool, linens, hardware, &c. In the neighborhood, which is remarkable for its fine scenery, is Fouquet's chateau of Vaux-Praslin, where the brilliant financier was arrested in the midst of a fête which he gave in honor of Louis XIV. The town was besieged by the Normans, and on several occasions by the English, who were finally expelled. At the beginning of the 12th cen-

tury Abelard, though very young, opened a school of philosophy in this town, which was at that time a favorite resort of the French court.

MELVILLE, ANDREW, a Scottish religious reformer, born in Baldov, Forfarshire, Aug. 1, 1545, died in Sedan, France, in 1622. He was educated at the university of St. Andrew's, and in 1564 repaired to the continent, and passed several years at Paris, Poitiers, and Geneva, alternately studying and teaching. In 1574 he returned to Scotland, and was appointed principal of Glasgow college, where he introduced important improvements. He took a prominent part in the theological controversies of his age, and in the establishment of Presbyterianism in Scotland. Toward the close of the year 1580 he was made principal of St. Mary's college in the university of St. Andrew's, and lecturer on theology and the oriental languages. In 1582 Melville opened an extraordinary meeting of the Presbyterian general assembly with a sermon, in which he vigorously opposed the absolute authority assumed by the court in ecclesiastical affairs. He assisted in drawing up the remonstrance against the policy of the court, subsequently presented to the king at Perth by a deputation of which he was the head. The earl of Arran, one of the council, being irritated at the bold tone of this document, asked fiercely: "Who dares subscribe these treasonable articles?" "We dare," replied Melville, and immediately seizing a pen, affixed his name to it. This was imitated by all his colleagues, and the council suffered them to depart uncensured. But within two years Melville was summoned before the privy council on a charge of treason for words uttered in the pulpit, and Arran exerted himself for his conviction. The accusation, however, could not be proved, and he was sentenced to imprisonment on the charge of irreverence toward the council; but he escaped to London, and returned to Scotland, on the fall of Arran, in Nov. 1585. In 1587, 1589, and 1594, he was chosen moderator of the general assembly; in 1590 he became rector of the university; and in 1595 he delivered, at the coronation of the queen, a Latin poem entitled *Stephaniakion*, which, being printed at the earnest solicitation of James VI., was read with admiration throughout Europe. He was accustomed to address the king with the utmost plainness upon his foibles and vanity; and being a member of a commission appointed in 1596 to remonstrate with regard to certain measures inimical to religion, he chided James so severely as to excite him to great anger, but finally subdued him and obtained every concession demanded. On James's accession to the English throne he continued his efforts to obtain control of the Scottish church, which had hitherto been thwarted in great part by Melville. In May, 1606, he and other leading Presbyterians were summoned to London under pretence of being consulted by the king and government upon Scotch ecclesiastical affairs. They obeyed, but soon discovered that they were not free

agents; and Melville, for having indited a Latin epigram expressive of his contempt for certain ceremonies he had witnessed at the royal chapel, was brought before the privy council, found guilty of *scandalum magnatum*, and committed to the tower, where he remained a prisoner till 1611, when, at the solicitation of the duke de Bouillon, he was liberated on condition that he should expatriate himself. Retiring to France, he there, through the influence of the duke, was appointed professor of theology at the university of Sedan, an office which he held till his death. Melville's earliest production was a volume of Latin poems, including a paraphrase of the "Song of Moses," and a portion of the book of Job (Basel, 1574). There is a MS. commentary by him on the Epistle of Paul to the Romans, still extant.—See the "Life of Andrew Melville," by Dr. McCrie (2 vols. 8vo., 1819).

MELVILLE, HERMAN, an American author, born in New York, Aug. 1, 1819. He is a grandson of Thomas Melville, one of the "Boston tea party." His boyhood was passed chiefly in Albany and Lansingburg, N. Y., and Berkshire co., Mass., until he reached the age of 18, when he shipped before the mast on a vessel bound for Liverpool, and returned home in the same manner, with his appetite for adventure sharpened rather than appeased by the voyage. In 1841 he embarked for the Pacific, as a sailor, on a whaling vessel, in which he cruised for 18 months; but, unable to endure the harsh conduct of the captain, he deserted with one of his comrades at Nukahiva, one of the Marquesas islands. His plan was to throw himself upon the hospitality of a neighboring friendly tribe, but losing his way he wandered into the Typee valley, where the warlike people who take their name from the valley held him 4 months in an indulgent captivity. At the end of that time he was taken off by a boat from an Australian whaler, which conveyed him to Tahiti. He passed some time in the Society and Sandwich islands, and in 1843 shipped on board the frigate United States at Honolulu, and arrived in Boston in Oct. 1844. "Typee," a narrative of his adventures in Nukahiva, told in a spirited and graceful style, appeared in 1846 in New York and London, and achieved an immediate success. It was followed in 1847 by "Omoo, a Narrative of Adventures in the South Seas," which recounts his escape from Typee and subsequent voyage. "Mardi and a Voyage Thither," a philosophical romance which was less admired, and "Redburn," founded on the incidents of his first voyage, appeared in the same year. He married in 1847 a daughter of Chief Justice Shaw of Massachusetts, and resided for a few years in New York. In 1850 he removed to Pittsfield, Mass., where he divided his time between the cares of a farm and authorship, successively publishing "White Jacket, or the World in a Man-of-War" (1850), "Moby Dick, or the White Whale" (1851), "Pierre, or the Ambiguities" (1852), "The Piazza Tales" (1856), and "The Confidence Man" (1857). In "Put-

nam's Monthly" he reproduced with various alterations the narrative of "Israel Potter" (reprinted in 1 vol., New York, 1855), a real character of the American revolution, whose adventures, as related by his own lips, were published by Mr. Henry Trumbull at Providence in 1824. In 1860 Mr. Melville sailed again on a voyage round the world in a whaling vessel.

MELVILLE, SIR JAMES, a Scottish soldier, statesman, and author, born at Raith, Fifeshire, about 1585, died at Hal-hill, in the same county, Nov. 1, 1607. At the age of 14 he went to the continent, where he occupied various official stations until 1664, when he returned to Scotland, and presented himself at the court of Queen Mary Stuart, who appointed him to office, and settled on him a pension of 1,000 marks. After the murder of Darnley he remonstrated with her on her partiality for Bothwell, whereupon he lost favor and retired from public life. On the accession of James he was made a gentleman of the bedchamber and a member of the privy council, and was even pressed by the king to accompany him to London, when he went to take possession of the throne of England. Melville however declined this invitation, and devoted his latter days to the composition of his "Memoirs of Sir James Melville of Hal-hill, containing an Impartial Account of the most remarkable Affairs of State during the last Age." The earliest edition of these "Memoirs" appeared in London in 1688; the latest and best in Edinburgh in 1827.

MELVILLE, VISCOUNTS. See DUNDAS, HENRY, and ROBERT S.

MELVILLE ISLAND, an island lying off the N. W. coast of Australia, between lat. 11° 8' and 11° 56' S. and long. 180° 20' and 181° 24' E.; area, about 1,800 sq. m. It is separated from the mainland on the E. by Dundas strait, which is 15 m. wide, and on the S. by Clarence strait and Van Diemen's gulf; while on the W. it is severed from Bathurst island by Apsley strait. The N. coast is low, and indented with shallow bays, but elsewhere the coast is high and precipitous. The greater part of the island is in wood. Alligators and turtles abound on the coasts. The climate from October to May, owing to the great heat and humidity of the atmosphere, is unhealthy, but from May to October it is salubrious. The natives are chiefly hunters, and appear more athletic and enterprising than those of Australia.

MELVILLE SOUND, or PARRY SOUND, a body of water in the north polar regions of America, lying between lat. 72° and 75° N. and long. 100° and 115° W., enclosed between the Parry islands (Melville, Byam Martin, Bathurst, &c.), on the N., Prince of Wales Land on the S. E., Prince Albert Land on the S. W., and Baring island or Banks's Land on the W.; length E. and W. about 800 m.; breadth N. and S. 200 m. Byam Martin channel opens into it on the N.; Banks's strait connects it with the Arctic ocean on the N. W.; on the S. an opening discovered by Capt. Allen Young of McClintock's

expedition in 1859, and since named McClintock channel, leads between Prince Albert and Victoria Lands and Prince of Wales Land into Victoria channel; and on the E. it communicates through Barrow strait and Lancaster sound with Baffin's bay.—MELVILLE ISLAND, which lies to the N. W. of the sound, is exceedingly irregular in form, and measures about 200 m. in length from E. to W. and 180 in greatest breadth. Its coast line is broken by several deep gulfs, and it has numerous peninsulas, the chief of which are Sabine and Dundas. It is separated from Bathurst and Byam Martin islands by Byam Martin channel, and from Prince Patrick and Eglinton islands by Fitz James and Kellet straits. The geological formation of its N. part is carboniferous limestone, and of the rest lower carboniferous sandstone with beds of coal.—MELVILLE PENINSULA is a projection of the N. coast of the American continent, bounded N. by Fury and Hecla strait, which separates it from Cockburn island, E. by Fox channel, S. by Frozen strait and Rowe's Welcome, and W. by Committee bay, at the foot of the gulf of Boothia. It is connected with the mainland by Rae's isthmus at the S. W. It lies between lat. 66° 10' and 69° 50' N. and long. 81° and 87° W., and measures about 250 m. from N. to S. and 150 m. from E. to W.

MEMBRANE, a general term applied to thin layers of tissue, more or less elastic, of a whitish or reddish color, lining either closed cavities or canals opening externally, absorbing or secreting fluids, and enveloping various organs. The simple membranes are either mucous, serous, or fibrous, which may be briefly treated of here.—The mucous membranes are so called from the peculiar fluid or mucus which they secrete; they line the passages of the body which communicate externally, and by which foreign substances are taken in or the secretions and excrementitious matter carried off; they are continuous with the skin, perform many of its offices internally, and at the points of contact, as in the lips, can hardly be separated by a distinct demarcation. Soft and velvety, reddish and very vascular, attached to muscle, cartilage, or even periosteum, their free surface is lined with epithelial cells, which are separated from the vascular surface by the thin, homogeneous, and apparently textureless primary or basement membrane; they present papillæ upon the tongue, villousities and folds in the alimentary canal, and depressions for glands almost everywhere. The three divisions of the mucous membranes are those lining the digestive, respiratory, and genito-urinary passages. The digestive mucous membrane begins in the mouth, extends through the œsophagus to the stomach, and through the intestinal canal to the anus, sending prolongations into the ducts of the salivary glands, liver, pancreas, and gall bladder. The respiratory mucous membrane lines the nose and the cavities and sinuses connected therewith, the lids, internal ear, larynx, trachea, and the bronchial ramifications. The genito-urinary mucous membrane extends externally from the

uriniferous tubes of the kidney, and into and through the reproductive organs. In each of these tracts the membranes present some slight modifications adapted for special functions. Mucous membranes are generally endowed with keen sensibility at their points of origin from the skin, as on the lids, lips, &c., but gradually become less sensitive and finally almost insensible, in a healthy state, in the interior of the organs; beside being the seat of various secretions and absorptions, they assist in the functions of digestion, respiration, and reproduction. (See EPITHELIUM, GLAND, and INTESTINE.)—Serous membranes are formed of fibro-cellular tissue, covered over with basement membrane and epithelial cells; they are very thin, smooth, transparent, and extensible, not having the folds, papillæ, and glands of mucous membrane; they are closed sacs, and are found wherever internal organs come in contact with each other, or lie in cavities where more or less motion is required; they consist of two layers, the first surrounding the organ itself, and the second reflected upon the parts with which it is in contact and on which it moves; the cavity is lubricated by a serous fluid, secreted by the cells and the basement membrane. They are of two kinds: those which line the visceral cavities, as the peritoneum in the abdomen, the pleura and pericardium of the lungs and heart, and the arachnoid of the brain and spinal cord; and the synovial membranes, which line the joints, sheaths of tendons and ligaments, and bursæ interposed between muscles and points of bone over which they glide. They are all shut sacs, except where the Fallopian tubes in most vertebrates open into the abdominal cavity. Serous and synovial membranes by their polished and well-lubricated surfaces secure the free movement of contiguous organs, as in the intestines, lungs, and joints; their fluid is in health only sufficient for this purpose, but in a state of inflammation the amount is largely increased, as in the dropsical effusions of peritonitis, pleurisy, pericarditis, hydrocephalus, and synovitis; their sensibility in the normal state is nothing, but in diseased conditions may become acute, as in pleurisy and peritonitis; their vitality is different from that of the organs they surround, and may be increased or diminished without the necessary participation of the latter.—Bichat gives the name of fibrous membranes to the aponeuroses of muscles, the capsules of the joints, the sheaths of the tendons, the periosteum, dura mater of the brain, the sclerotic coat of the eye, &c.; these are never free, but are in contact with and adherent to the parts surrounding, and not moistened by secreted fluid; they are whitish, of a pearly and often shining lustre, and may form sacs, sheaths, or extended layers of thin tissue; possessing elastic fibrous tissue, insensible, they afford strength to organs, retain the muscles and tendons in place, give the shape to the limbs, favor the movements of the skin and superficial muscles, and assist the venous circulation. These

membranes are variously combined; for example, the *tunica albuginea* of the testes and the pericardium are fibro-serous, a portion of the gall bladder is sero-mucous, and the ureters and membranous part of the urethra are fibro-mucous.—Membranes, especially the serous, may be formed as the accidental products of disease, as in cysts in various parts of the body. False membranes are the results or mode of termination of acute inflammation, having for their base a plastic coagulable lymph, capable of organization; such membranes are sometimes salutary, as in certain adhesions and cicatrices; at other times they impede the action of vital organs, as the pleuritic and peritonitic adhesions; under the influence of violent or special inflammations they may endanger life by closing passages, as in the false membrane thrown out in croup. (See LYMPH.) The membranes of the fœtus have been alluded to under EMBRYOLOGY, and several other membranes under the organs to which they specially belong.

MEMEL, the northernmost town of Prussia, in the district of Königsberg, situated on the Baltic sea near the Russian frontier, at the N. end of the Kurisches Haff, and at the mouth of the river Dange; pop. about 11,000. It is fortified and well built, possesses several churches, an excellent naval school, and various educational and charitable institutions. The harbor is defended by a citadel, and a considerable part of the trade between Russia and Germany passes through the town. The registered shipping consists of 90 vessels; the number of clearances in 1855 was 1,820 vessels, against 1,809 in 1854. It is the centre of the Baltic timber trade. The other principal exports are grain, linseed, hemp, flax, hides, tallow, &c., most of which are received from Russia and Poland. The imports are salt, coal, colonial produce, herrings, manufactured goods, &c.—Memel was built in the middle of the 18th century by the Teutonic knights. In the 17th century it was for some time in the possession of the Swedes, and in 1757 it was taken by the Russians. In 1806, after the battle of Jena, Frederic William III. of Prussia resided some time at Memel. In 1854 the town was nearly destroyed by fire.

MEMEL RIVER. See NIEMEN.

MEMLING, HANS. See HEMLING.

MEMMI, SIMONE, or more properly **SIMONE DI MARTINO**, an Italian painter, born in 1285, died in Avignon in 1345. He belongs to the Siennese school, and was one of the first to modify the severity and hardness of the Byzantine manner by imitating the softer style of Giotto. After the death of the latter in 1336 he was invited to the papal court at Avignon, where he is said to have painted the portrait of Laura de Sade, on account of which he is mentioned in two of Petrarch's sonnets. At Avignon he also executed a miniature illumination for a manuscript Virgil, once owned by Petrarch and now preserved in the Ambrosian library at Milan. Of the few pictures attributed with certainty to him, an excellent specimen representing the

finding of Christ in the temple is now in the Liverpool institution.

MEMMINGEN, a fortified town of Bavaria, in the circle of Swabia, on the Aach, 41 m. S. W. from Augsburg; pop. 7,200. Here on Oct. 13, 1805, 4,000 Austrians surrendered to the French under Soult.

MEMMINGER, CHARLES GUSTAVUS, an American lawyer and politician, born in Würtemberg, Germany, Jan. 7, 1808. At about 2 years of age he was brought by his mother to Charleston, S. C., his father having previously died. He was left an orphan soon after his arrival, and was an inmate of the orphan asylum of Charleston until 9 years of age. His talents had already attracted attention, and he was received into the family of Gov. Thomas Bennett, under whose patronage he was educated at the South Carolina college, and was graduated in 1820. He began the practice of the law in Charleston in 1825. He engaged warmly in the nullification conflict as a leader of the union party, which dwindled into a feeble minority, thus preventing his political advancement. He wrote frequently for political journals during this controversy, and was the author of "The Book of Nullification" (1832-'3), satirizing the advocates of the doctrine in biblical style. In 1836 he was elected to the legislature, and was soon after sent as commissioner of the state to the legislatures of North Carolina and Kentucky with reference to the establishment of a railway connection between the Atlantic states and the Mississippi. In the legislature, he opposed the suspension of specie payment by the banks in the pressure of 1839. He was associated with the attorney-general Bailey for the prosecution in a principal case, the defence in which was conducted by Legaré, Petigru, and King; and the result was that the banks were declared to have forfeited their charters, a sentence which was afterward provisionally remitted by the state. He also urged the adoption of the sub-treasury system, and supported by an elaborate report the measures of Mr. Calhoun. In 1848 he unsuccessfully resisted the grant of a new charter to the bank of South Carolina. For nearly 20 years he was at the head of the finance committee in the lower house of the legislature, from which he retired in 1852. He was again returned in 1854, having become particularly interested in popular education and in the reformation of the public school system. The present organization and efficiency of the schools of Charleston, and especially of the normal school, are chiefly the result of his policy, which was introduced against strong opposition. In 1859 he was appointed to represent the state as a commissioner to Virginia, with a view to securing the coöperation of the states of the South against the assaults of abolitionists, the immediate occasion of the movement being the insurrectionary attempt of John Brown at Harper's Ferry.

MEMNON, a hero of the Trojan war. He was a son of Tithonus and of Eos or Aurora. Homer in the *Odyssey* describes him as the hand-

some son of Eos who brought a force of Ethiopians to assist in the defence of Troy against the Greeks. Hesiod calls him king of the Ethiopians. He was slain by Achilles. Some writers suppose him to have been an Indian, the term Ethiopians being applied to the Indians by the Greeks. Others conjecture him to have been an Assyrian general sent from Nineveh to the aid of Troy. The Greeks in later ages confounded him with the Egyptian king Amenophis III., whose colossal statue in the neighborhood of Thebes greatly excited their wonder by its vocal powers, though it seems to have been little regarded by the Egyptians. This famous statue, the vocal Memnon as it is called, is the northernmost of two colossal sitting figures, in the approach to a temple now ruined, in the quarter of western Thebes called Memnonia by the Greeks. The height of each of these statues is 47 feet, and they rest upon pedestals about 12 feet high. On the lower part of the vocal Memnon there are 72 inscriptions in Greek and Latin, by the emperor Hadrian, the empress Sabina, and by several governors of Egypt and other travellers, official and private, testifying that they have visited the Memnon and heard his voice at sunrise. It appears from these inscriptions and from the ancient writers that this vocal phenomenon was not observed till after the Roman conquest of Egypt. The sound is said to have resembled the twanging of a harp string or the striking of brass, and it occurred at sunrise or soon after. Strabo, who visited it with Ælius Gallus, the governor of Egypt, states that he heard the sound, but could "not affirm whether it proceeded from the pedestal or from the statue itself, or even from some of those who stood near its base." He does not mention the name of Memnon, and it was not till after his time apparently that the Romans began to suppose the statue to be that of the son of Tithonus. In the lap of the statue is a stone, which, on being struck, emits a metallic sound that might still be made use of to deceive a visitor; and from its position and the fact that there is a squared space cut in the block behind, as if to admit a person who might thus lie concealed from the most careful observer in the plain below, it is supposed to have been so used. Sir Gardner Wilkinson says: "Having remarked the peculiar sound of this stone, and subsequently finding in one of the inscriptions, that a certain Ballilla had compared it to the 'striking of brass,' I posted some peasants below, and ascended myself to the lap of the statue, with a view of hearing from them the impression made by the sound. Having struck the sonorous block with a small hammer, I inquired what they heard; and their answer: 'You are striking brass,' convinced me that the sound was the same that deceived the Romans, and led Strabo to observe that it appeared to him as the effect of a slight blow. That it was a deception there can be little doubt; the fact of the emperor Hadrian hearing it thrice looks very suspicious; a natural phenomenon

would not have been so complimentary to the emperor when it sounded only once for ordinary mortals." Other investigators, however, maintain that it was impossible so clumsy an imposture should have passed without detection for centuries, while the statue was constantly exposed to the inspection of intelligent Romans, who as foreigners and conquerors in Egypt would not hesitate to detect and expose the tricks of the native priesthood. It is said that similar sounds have been produced from stones by the influence of the sun's rays; and several of the scientific men attached to Bonaparte's army in Egypt have stated that they frequently heard such a sound, always shortly after sunrise, apparently issuing from one of the roof stones of the temple of Karnak. Mr. Lane states that in a neighboring temple he heard repeatedly a sound like that of a harpstring from some stone above him. This occurred at noon, and he supposes that at this time the stone became exposed to the sun, and the sudden expansion from its warmth produced the sound.

MEMPHIS, a city and port of entry of Shelby co., Tenn., situated on the Mississippi river, just below the mouth of Wolf river, on the fourth Chickasaw bluff, 420 m. below St. Louis; pop. in 1840, 8,839; in 1855, 16,000; in 1860, about 50,000. The bluff on which it stands is about 80 feet above the highest floods, and along its front extends a fine esplanade several hundred feet wide, facing which are some of the principal warehouses. The landing place is at a sandstone ridge which projects into the river from the foot of the bluff. The city is handsomely laid out and adorned with many elegant private residences. It has 15 churches (3 Baptist, 1 Cumberland Presbyterian, 8 Episcopal, 3 Methodist, 3 Presbyterian, 1 Reformed, and 1 Roman Catholic), 8 seminaries for young ladies, several male academies, an orphan asylum, 2 medical colleges, 5 daily and 8 weekly newspapers, 7 banks, and 7 insurance offices. The public schools in 1860 numbered 1,682 pupils. Memphis is by far the most important town between St. Louis and New Orleans, and has an immense business, especially in cotton, the shipments of which in the year ending Sept. 1, 1860, amounted to about 400,000 bales. Three great railroads now enter the city, viz.: the Memphis and Charleston, the Memphis and New Orleans, and the Memphis and Ohio. Forty miles of the Memphis and Little Rock railroad are also finished, and the whole is fast approaching completion. The city contains an oil factory, a car and wagon factory, a steam boiler factory, and 3 iron foundries. It was laid out in 1820.

MEMPHIS (Egyptian, *Menfis* or *Mennafre*, "good abode" or "the abode of the good one"—Osiris; in Scripture, *Moph*), an ancient capital of Egypt, situated on the W. bank of the Nile, 10 m. S. from the modern city of Cairo, in lat. 30° 6' N., long. 31° 18' E. Herodotus gives the following account of its foundation: "The priests said that Menes was the first king of Egypt, and that it was he who raised the dike which pro-

fects Memphis from the inundations of the Nile. Before his time the river flowed entirely along the sandy range of hills which skirts Egypt on the side of Libya. He, however, by banking up the river at the bend which it forms about a hundred furlongs south of Memphis, laid the ancient channel dry, while he dug a new course for the stream half way between the two lines of hills. To this day, the elbow which the Nile forms at the point where it is forced aside into the new channel is guarded with the greatest care by the Persians and strengthened every year; for if the river were to burst out at this place and pour over the mound, there would be danger of Memphis being completely overwhelmed by the flood. Menes, having thus, by turning the river, made the tract where it used to run dry land, proceeded in the first place to build the city now called Memphis, which lies in the narrow part of Egypt; after which he further excavated a lake outside the town, to the north and west, communicating with the river, which was itself the eastern boundary. Beside these works, he also, the priests said, built the temple of Vulcan (Phthah), which stands within the city, a vast edifice, very worthy of mention." According to Diodorus, Memphis was about 17 m. in circuit. The mounds of the modern village of Mitrahenny mark the eastern portion of the city, while its western limits extended beyond the pyramids of Sakkara, and included in its suburbs those of Abousir and Dashoor. It was remarkable for its fine and healthful climate, and for the beauty of the view from its walls. Rich green meadows, covered with lotus flowers and intersected by canals, bounded it on the N. and S. Its position was such as to command the whole inland trade of Egypt, ascending or descending the Nile. It was the chief seat of learning and of religion in Egypt, the principal place of the worship of the god Phthah, and the chosen residence of the sacred bull Apis, whose temple here was celebrated for its colonnades through which the great processions were conducted. The other great temples were: that of Isis, which Herodotus describes as spacious and beautiful, commenced at a very early period, and completed by Amasis, 564 B. C.; the temple of Serapis, in the western quarter of the city; the temple of Phra or the sun; and the temple of Phthah, the most ancient of all, and the largest and most superb.—Memphis was the seat of successive dynasties, the 3d, 4th, 5th, 6th, 7th, and 8th of Egyptian history, who reigned, with one considerable interval, for nearly 1,000 years. By the 4th dynasty the great pyramids were built. It was also the capital during the supremacy of the shepherd kings. At a still later period, under the dynasties that succeeded the Theban, it became again the royal abode. The Persians made it the metropolis of their African possessions, and it continued to be the chief city of Egypt until the foundation of Alexandria, after which it gradually declined, and in the course of ages sunk into such utter

decay that its very site, overwhelmed with drifted sand, was a matter of dispute among antiquaries. The researches of M. Mariette since 1850 have removed all doubt as to its position, and have disclosed an immense amount of remains, including ruins of temples and of palaces, and statues, bass-reliefs, and inscriptions, to the number of several thousand.

MÉNAGE, GILLES, a French author, born in Angers, Aug. 15, 1618, died in Paris in 1692. He studied law and practised for a short time in Angers, Paris, and Poitiers, but abandoned this profession for the church. He lived for a short time with Cardinal de Retz, but finally established himself in a house in the cloister of Notre Dame, where on Wednesdays he entertained numbers of the wits and scholars of his day. His wit and erudition became celebrated, and the *mercuriales*, as the meetings at his house were called, are still mentioned by scholars. The quarrels of Ménage, his social relations, and the epigrams and witticisms which they called forth, occupy a prominent position in the literary history of the 17th century. He wrote many works, of which the most important are: *Origines de la langue Française* (Paris, 1650), afterward enlarged and published as *Dictionnaire étymologique de la langue Française* (1694); *Poemata Latina, Gallica, Græca et Italica* (1658); and *Anti-Baillet* (1685). After his death, his friends published, under the title of *Ménagiana*, a collection of his witticisms and table talk, which was highly praised by Bayle. The best edition is that by La Monnoye (1715).

MENAI STRAIT, a narrow channel of Wales, which separates the island of Anglesea from Caernarvonshire. Its direction is nearly S. W. and N. E., its length about 11 m., and its breadth from 200 yards to 2 m. The navigation of this strait was formerly very difficult and hazardous; but, in consequence of the removal of many of the rocks which obstructed it, vessels of less than 100 tons burden, and sometimes larger craft, can now pass through in safety. The Menai channel is crossed by two stupendous bridges about a mile apart, the Menai suspension bridge and the Britannia bridge, for an account of which see BRIDGE, vol. iii. pp. 689, 690.

MENANDER, an Athenian dramatic poet, born in 342, died in 291 B. C. Alexis, the comic poet, was his paternal uncle, Theophrastus his preceptor, and Epicurus his intimate friend. Few of the events of his life are known. The merits of his comedies gained him the patronage of Demetrius Phalereus, and of the first Ptolemy, who invited him to his court at Alexandria; this invitation he however declined. His intimacy with Phalereus involved him in danger after the expulsion of that statesman from Athens by Poliorcetes; and he would have been put to death had it not been for the intercession of Telesphorus, son-in-law of the latter. He is said to have been drowned while swimming in the harbor of Piræus. The Athenians raised a monument to his memory beside that of Euripides,

and placed his statue in the theatre. Menander was the greatest poet of what is termed "the new comedy." He it was in fact who purified it from the coarseness and buffoonery of the old comedy, and infused into it that pathos and elevation of sentiment which distinguished it from the productions of Aristophanes, his great predecessor in the comic drama. He was the author of a vast number of comedies, which maintained their place on the stage for some centuries, and were models for both Greeks and Romans. Of his imitators Terence was the most servile and unscrupulous, his plays being almost entirely translations or aggregations of those of his Hellenic master. Hence Cæsar's celebrated sarcasm relative to the plagiarist: *O dimidiata Menander*. The *editio princeps* of the extant fragments of Menander is that of Morellius (Paris, 1558); the best edition is that of Meineke in his *Fragmenta Comicorum Græcorum* (Berlin, 1841). See BENOÎT, *Essai historique et littéraire sur la comédie de Ménandre* (Paris, 1854).

MENARD, a central co. of Ill., bounded N. partly by the Sangamon river, which intersects it; area, 302 sq. m.; pop. in 1855, 8,029. It has a level surface and productive soil. The productions in 1850 were 69,106 bushels of wheat, 1,280,206 of Indian corn, 129,107 of oats, and 81,752 lbs. of wool. There were 11 grist mills, 11 saw mills, 2 woollen factories, 8 tanneries, 18 churches, and 720 pupils attending public schools. Capital, Petersburg.

MENASSEH BEN ISRAEL, a Dutch rabbi, born in Spain about 1604, died in Amsterdam about 1659. His father, a concealed Jew, fled to Holland, and settled at Amsterdam, where the son was placed under the tuition of Rabbi Isaac Uziel. At the age of 18 he succeeded his master in the office of preacher and expounder of the Talmud. He established a press in his own house, at which he printed 3 editions of the Bible, and several rabbinical books in the Hebrew and Spanish languages. During the protectorate he visited England, and was graciously received by Cromwell, for whom he wrote his "Defence of the Jews" (London, 1656), soliciting for that people the permission to settle in England, whence they had been expelled since the reign of Edward I., which was granted. He was the author of many learned theological works in various languages, the most important of which are: *Conciliador nel Pentateucho* (Amsterdam, 1682), translated into Latin by Dionysius Vossius; *De Resurrectione Mortuorum* (1686); *De Fragilitate Humana ex Lapso Adam, deque Divino Auxilio* (1642); and *Spee Israelis* (1650). His "Defence of the Jews" was translated into German by the philosopher Mendelssohn, and augmented by an equally valuable introduction. An English version of the *Conciliador* was published in London in 1842 (2 vols. 8vo.). His life has been written in English by the Rev. Thomas Pococke (London, 1709).

MENDÆANS. See CHRISTIANS OF ST. JOHN.

MENDELSSOHN, MOSES, a German scholar and philosopher of Jewish race, born in Dessau, Sept. 10, 1729, died Jan. 4, 1786. His father was a transcriber of the Pentateuch and master of a Hebrew day school, both precarious professions. He was early sent to the public Talmud school, where he was taught to recite mechanically the Mishna and Gemara, and relates that at the age of 7 years he was usually called up at 8 or 4 o'clock in the morning to proceed to the severe tasks of the school, after drinking a cup of tea. Even at that age he manifested a spirit of thorough inquiry, and mastered the Hebrew language, so that he could write it with purity and elegance, and also metrically. He was still young when the "Guide of the Erring" (*Moreh nebuchim*), by Maimonides, became the object of his enthusiastic study. He meditated on it by day and by night, acknowledged throughout his life his obligations to it, and by his severe study of it, regardless of health, laid the foundation at once of his mental culture and of bodily disease and suffering. "Maimonides," he wrote, "is the cause of my deformity; he spoiled my figure, and ruined my constitution; but still I doat on him for the many hours of dejection which he has converted into rapture." At the age of 14 he followed his friend and teacher Rabbi Frenkel to Berlin, and, without the means of procuring a single meal, was eager only for erudition. His engaging manners, notwithstanding his extreme diffidence, gained him friends; and having been presented by a patron of aspiring young Jews with an attic lodging room and two days' board weekly, he began to prosecute his studies of the Talmud and of philosophy. He had long meditated how to learn the Greek and Latin languages without oral instructions or even an elementary book, when a young physician noticed his enthusiasm and offered him a quarter of an hour daily of gratuitous instruction. Having overcome the declensions and verbs, and purchased a second-hand dictionary with a few groschen which he had earned by copying, he was prepared to read whatever Latin book he could get hold of. This happened to be a Latin translation of Locke's "Essay on the Human Understanding;" and so thoroughly did he make his way through philological and metaphysical difficulties, that on completing the task he was able to read the Latin classics with ease and judgment. He became intimate with the mathematician Israel Moses, under whom he studied Euclid in a Hebrew translation, and with whom he discussed what he read in Latin and German. Through another friend he obtained elementary instruction in the French and English languages. It had been his custom whenever he purchased a loaf to notch it according to his pecuniary prospects into so many meals, never eating according to his appetite, but to his finances. At length he became acquainted with an opulent Jewish manufacturer, and was admitted into his family at first as tutor to his children, but subsequent-

ly became his partner in business. By day he managed an extensive silk manufactory, while the greater part of his nights was devoted to study and writing. In 1744 began his acquaintance with Lessing, and the latter pages of the *Morgenstunden* record their enduring mutual affection. Their recognized intimacy, and the accession of Nicolai and Abbt to the circle, contributed much to overthrow the *Judeophobia*, then a prevalent prejudice in Germany. He had previously published some moral tracts, in illustration of aphorisms extracted from rabbinical writings. In 1755 he published a treatise *Ueber die Empfindungen*, a profound disquisition on problems of æsthetics, and in connection with Lessing a discussion entitled *Pope ein Metaphysiker*, the design of which was to elucidate the maxim: "Whatever is, is right." These were followed by other short treatises remarkable for their acuteness, originality, ethical tone, and beauty of style, which, after passing through several editions separately, were collected under the title of *Philosophische Schriften* (Berlin, 1761). He was one of the most active contributors to the *Bibliothek der schönen Wissenschaften*, and to the *Briefe, die neueste Literatur betreffend*. The royal academy of Berlin awarded him the prize for a memoir on the question: "Are metaphysics susceptible of mathematical demonstration?" though Kant was one of his competitors. In 1762 he was married, and the death of his first child in the following year was the occasion of his defending Spalding against Abbt in their controversy on human destiny. His interest in the subject led him to write an imitation of Plato's "Phædon," adding all the proofs of the immortality of the soul that could be collected or suggested, and thus producing his most popular work, entitled *Phædon, oder über die Unsterblichkeit der Seele* (Berlin, 1767), which was soon translated into almost all European languages, as well as into Hebrew. His leading and peculiar argument is that for every change there must be an intermediate condition between the first and the second state, a period of time in which the process of change takes place; that the soul, being simple, and incapable of resolution into component parts, can perish only by being absolutely annihilated; that there can be no intermediate state between life and annihilation, being and not-being; and that therefore, the necessary conditions not being satisfied, the change cannot be operated, and the soul is immortal. Kant has shown the failure of this argument against the hypothesis of gradual annihilation. We can conceive that the soul may be gradually extinguished, without any resolution of parts; that its "intensive magnitude," as Kant terms it, may be gradually diminished, as a deep blue color may gradually fade away without any diminution of the colored surface. Mendelssohn's fame was at its height, and the learned were wondering that so elegant and philosophic a scholar should be at once so strict a Hebrew and so liberal in his

expressions, when he received a public challenge from Lavater either to refute Bonnet's arguments in support of Christianity or to renounce Judaism. Constitutionally averse to all controversy, and habitually reserved on subjects of religious dispute, he answered the challenge with an adroitness and candor that satisfied all parties, and while avoiding either horn of the dilemma drew from Lavater an apology and retraction of his peremptory address. The agitation caused by this matter induced a dangerous illness, which for a long time rendered him incapable of intellectual labor. Mendelssohn exerted an important influence by his efforts for the elevation of his Jewish countrymen. His German translation of the Pentateuch, and metrical version of the Psalms, are admirable for elegance and perspicuity; and their publication, accompanied by scriptural comments in Hebrew by himself and a circle of friends, makes an epoch in the history of modern Judaism. In defence of the rights of his Jewish brethren he wrote his introduction to his translation of Rabbi Menasseh ben Israel's "Apology of the Jews" (Berlin, 1782). In 1788 appeared his *Jerusalem, oder über religiöse Macht und Judenthum*, a vindication both of religious tolerance and of Judaism, and still one of the best books on those topics. He published in 1785 his *Morgenstunden*, consisting of lectures on the existence of God, the original design of which had been to instruct his eldest son and other Jewish youths in the principles of religion. It contains an affectionate memorial of Lessing, and was the occasion of Jacobi's letters to him *Ueber die Lehre des Spinoza*, in which Lessing is charged with being a Spinozist. Mendelssohn immediately answered with his usual sagacity, and with unusual indignation and irony, in a dissertation addressed *An die Freunde Lessings*, concerning which Kant said: "It is Mendelssohn's fault that Jacobi thinks himself a philosopher." His health was seriously injured by the excitement attending this effort, and a slight cold caught soon after terminated fatally. No other German author has given to philosophical thought so simple and noble an expression in the form of epistles and dialogues.—The most complete edition of his works appeared under the care of his grandson G. B. Mendelssohn (7 vols., Leipsic, 1843-'5). His life was written, among others, by Samuels (2d ed., London, 1822).

MENDELSSOHN-BARTHOLDY, FELIX, a German musical composer, born in Hamburg, Feb. 3, 1809, died in Leipsic, Nov. 4, 1847. He was a grandson of Moses Mendelssohn, and many of his other relatives were distinguished persons. His father, Abraham Mendelssohn-Bartholdy, founded in connection with his brother Joseph the firm of Mendelssohn and co., still continued by the brothers of Felix as one of the first banking houses of Europe. His father had added the name of Bartholdy to his own, out of regard for his wife, a lady of the Bartholdy family, which had also produced sev-

eral eminent persons, and most members of which have exchanged the Jewish for the Christian faith. The father of Felix, too, became a convert to Christianity, and the son was brought up in the Lutheran faith in Hamburg, whither his parents had removed during his infancy. Goethe was foremost among the many distinguished persons who became interested in his precocious genius, and Hummel predicted for him a brilliant career. Indeed, he could almost sing and compose before he could speak, and he was not yet 6 years old when he displayed his skill on the piano. Zelter, the friend of Goethe and the teacher of Meyerbeer, became his instructor in composition, and Ludwig Berger his master on the piano. In his 9th year he gave his first public concert in Berlin, and a year afterward in Paris. From that early age he began to write compositions for the piano, violin, viola, and violoncello; and 8 of his quartets published in 1824 still hold a place among classical musical works. In 1825 he made a second journey to Paris with his father, who was at length determined by the encouraging advice of Cherubini and other competent judges to let his son devote himself exclusively to music as a profession. He gave successful concerts in Paris in company with Baillot, and after his return to Berlin produced in 1827 his first opera, *Die Hochzeit des Gamacho*, in which the principal characters of Cervantes's "Don Quixote" are introduced. But the music met with a cold reception, and the opera was immediately withdrawn from the stage. He now travelled several years in England, France, and Italy, and was rewarded for his unremitting zeal by the unbounded admiration with which his overture to Shakespeare's "Midsummer Night's Dream" was universally received. In this composition the influence of the genius of Weber upon his mind is especially evident in the ideas and the coloring; but although the artistic construction is irreproachable, the overture, as a whole, is deficient in the originality of that master's fairy work and supernaturalism. But the fanciful, the delicate, and the grotesque are deliciously blended in the music, which breathes throughout Shakespeare's own inspiration. Mr. Benedict says of it: "The effect of the first performance of the overture in London was electrical. All at once, and even when least expected, the great gap left by the death of Beethoven seemed likely to be filled up." The rest of the music for the "Midsummer Night's Dream" was written by him afterward for the purpose of accompanying the performance of the play. Mendelssohn spent some time in Edinburgh, and immortalized the popular music of the Scotch bagpipers by his symphony in A minor, since called the Scottish symphony, which was first performed under his own direction by the London philharmonic society. Many other reminiscences of his tour through the highlands are to be found in his compositions and his orchestral pieces. "The Isles of Fingal" reproduces the impressions

which the wild shores of the Hebrides had made upon him. After his return to Germany he endeavored to establish, in concert with Immermann, musical and dramatic entertainments at Düsseldorf, to consist solely of the most select productions. This enterprise failed, but increased his reputation as a conscientious artist, ambitious to impart to his profession the highest character of excellence. His residence at Berlin was embittered by the intrigues of his opponents, and in 1835 he accepted the directorship of the famous Leipsic concerts, which under his care attained to an unprecedented degree of perfection. He was, however, even more appreciated in England than in his own country, and chiefly on account of his compositions of sacred music. His oratorio "St. Paul," after having been produced at Düsseldorf and Leipsic, was performed under his own direction at the Birmingham festival of Sept. 20, 1837, where it was received with great enthusiasm. His fame rests in a great measure upon this oratorio and upon that of "Elijah," which was written expressly for the Birmingham festival, the first performance taking place there Aug. 26, 1846. It is considered in England as his crowning work. Mendelssohn had been engaged for 9 years upon this composition, and had resigned the post of inspector of music, which he had for some time filled in Berlin, in order to superintend its performance in England; and shortly before his death he was again in London to attend personally the sacred harmonic society's concert at Exeter hall. He had resumed his place at Leipsic since 1845; and shortly after his return there from his visit to England in 1847, his health was impaired by grief at the sudden death of a beloved sister. A tour to Switzerland for the recovery of his strength brought only temporary relief; a relapse took place soon after his return to Leipsic, and he died in the prime of his manhood from an affection of the brain. Of his many posthumous compositions none have yet been published excepting a fragment of an oratorio entitled "Christus," and some scenes of "Loreley," a romantic opera; but they are understood to include many other important compositions. Among the most famous of his many published works are his music for Goethe's "Walpurgis Night," the "Antigone" and "Œdipus" of Sophocles, "Athalie," and a great number of admirable sonatas, concertos, trios, &c. In his "Songs without Words" for the pianoforte, Mendelssohn opened a new vein of beauty, and produced an indispensable work for pianists by throwing aside language and indulging in supposititious sentiment, at the same time keeping in view the scope and character of the instrument, and inventing charming traits of accompaniment. Mendelssohn's appreciation of dramatic effect, so remarkably displayed in his music to the "Midsummer Night's Dream," led his friends to expect from him important contributions to the lyrical drama; but his admiration for Bach and Handel led him to the comparatively easier labor of composing sacred

music. England especially, with her great school for the oratorio at Exeter hall, and with her resources of choral singing and the religious sentiment of the people in favor of sacred music, proved auspicious for the great works of Mendelssohn. In devoting himself to the oratorio, this master had the tact not to stifle it with fugues, but to write dramatically, and with freedom from antiquated formalisms. His oratorios have thus become the pillars of his fame. Mendelssohn was as much beloved for the beauty of his character as for his genius. His life was free from the struggles and cares which generally beset aspirants for renown, and from his earliest childhood he was permitted to indulge his tastes without hindrance. He devoted himself exclusively to his profession, and brought to bear upon it the severe studies of a laborious artist and the equanimity of a serene and dispassionate mind. He lacked the fire and the spontaneity of the poetic nature, but he was deeply penetrated with a sense of the dignity and value of his mission. His works form a noble page in the progress of music in the 19th century.

MENDES, a city of ancient Egypt, situated in the delta at the point where the Mendesian arm of the Nile flows into the lake of Tanis. It was a considerable place under the Pharaohs, but was in ruins in the 1st century B. C. Its remains are seen in the mounds of Ashmoun on the canal leading to Menzaleh. It was the seat of the worship of a deity represented under the form of a goat, whom the Greek writers on Egypt called Pan, but who was probably Khem, one of the 8 great gods of Egypt, and the symbol of the generative principle.

MENDEZ-PINTO, FERNAM, a Portuguese adventurer, born at Old Montemayor, near Coimbra, about 1510, died at Almada, near Lisbon, about 1580. He was the child of poor parents, and in 1521 was placed in the service of a noble lady of Lisbon. At the end of a year and a half an adventure, the particulars of which are not known, put his life in peril, and caused him to embark precipitately on a ship just going to sea. The vessel was soon taken by pirates, who after much ill treatment put him ashore on the coast of Portugal. Afterward he passed into the service successively of two noblemen, and at length, in search of fortune, sailed for the East Indies, and in 1537 arrived at Diu on the W. coast of Hindostan, which city the Portuguese had seized and fortified two years before. Here he embarked as a volunteer in a vessel sent to cruise against the Turks in the Indian ocean and Red sea. After various adventures and a visit to Abyssinia, Pinto was captured by the Turks near Babelmandeb, carried to Mocha, and sold as a slave, first to a Greek renegade, and next to a Jew, from whom he was ransomed by the Portuguese governor of Ormus, who furnished him with the means of returning to India. At Goa he met Dom Pedro de Faria, captain-general of Malacca, who, perceiving his ability, took him

into his service and sent him on numerous missions to the native princes. On one of these expeditions he was shipwrecked, made a slave, and sold to a Mohammedan merchant who carried him to Malacca for ransom. He was soon sent on another mission to the gulf of Siam; but his vessel, while lying in the river near Lugor, was boarded and captured by pirates. He escaped, though wounded, by swimming to the shore, and having reached Patana, a Portuguese port south of Lugor, he engaged with some friends in fitting out a small cruiser and went in search of the pirates, several of whose vessels richly laden the Portuguese captured, though they soon lost by shipwreck all the treasures thus acquired. Pinto and his companions then procured still another vessel, met and captured the pirate who had robbed them at Lugor, suffered another shipwreck, and some of them having been detained as prisoners at a town on the coast of China, the others rescued them and plundered the place, and then put into Liampo, or Ningpo as it is now called. Here Pinto and some other Portuguese, in May, 1542, were persuaded by a Chinese pirate to undertake an expedition to the island of Calempui, not far from Peking, where, as they were led to believe, were the tombs of 17 Chinese kings, containing vast treasures. Their attempt to plunder these tombs was only partially successful, and they fled terrified at the alarm raised by the guardians of the treasures. Shortly afterward they were again shipwrecked on the Chinese coast; and after witnessing the drowning of most of his comrades, Pinto with a few others got on shore, where they lived awhile by begging, but were apprehended and taken to Nanking, and on a charge of being thieves were condemned to lose their thumbs; but by appealing, they got this punishment commuted into imprisonment in the town of Quansi on the northern frontier, where they were set to work in repairing the great wall. They were delivered in a few months by an inroad of Tartars, who carried them to assist in the siege of Peking, and then took them back to Tartary. After a short residence in that country Pinto went in the train of an ambassador to Cochin China, and from there made his way to Macao, which was not yet occupied by the Portuguese. Here, in default of any other resource, he enlisted with two other Portuguese in the service of a Chinese pirate, whose vessel, after a desperate engagement with a superior force of other pirates, escaped under cover of the night and was driven by a gale to the coast of Japan, which had not then been visited by Europeans. Pinto was well received by the Japanese, and after a considerable stay in their country he sailed back to Liampo with the Chinese pirate. His report of the discovery of Japan and its great wealth and magnificence created such an excitement among the Portuguese at Liampo, that in 15 days 9 hastily equipped ships were despatched for the new Eldorado. Eight of them foundered on the voyage, and the one in

which Pinto sailed was driven to the Loo Choo islands, then first seen by Europeans, and wrecked there. Pinto with difficulty got ashore, and after many fresh adventures and dangers found his way back in a Chinese junk to Liampo, whence after still more vicissitudes he proceeded to Malacca. He next visited Pegu, Siam, Java, and some of the neighboring countries, in which he met with a singular variety of fortune; and in 1547 he embarked at Malacca on a second voyage to Japan. Soon after his arrival there a civil war broke out, in which Pinto took part for a while; but having at length profitably disposed of the merchandise he carried thither, he returned to Malacca, where he met St. Francis Xavier, "the apostle of the Indies," with whom in the course of a few months he made a third visit to Japan, arriving there in Aug. 1548. By these voyages to Japan Pinto acquired great wealth, and in 1553 he was at Goa, preparing to return to Portugal, when the arrival there of the body of Xavier, and his conferences with Father Nugnes Barreto, the vice-provincial of the Jesuits, so excited his religious enthusiasm, that he devoted his whole fortune, except 2,000 crowns which he sent to his poor relations in Portugal, to the foundation of a seminary for propagating the faith in Japan. He was then appointed ambassador from the Portuguese viceroy of India to the king of Bungo in Japan, and sailed for that country in company with the Jesuit Nugnes. Before setting out he took the vows as a member of the order of Jesuits; but on his arrival in Japan his zeal evaporated, and he was released from his vows. He returned with Nugnes to Goa, and sailed thence for Lisbon, where he arrived Sept. 22, 1558, bearing to the queen regent a letter from the viceroy at Goa, recommending him warmly to the favor of the government as a man of the highest experience in East Indian affairs. He spent a few years in attendance on the court, which brought him nothing but promises, and which he says were more tedious and harassing than his 21 years of service in the East, though during that time he had been 18 times taken by the enemy and 17 times sold as a slave. The first extant account of his travels and adventures is given in a collection of Jesuits' letters published in Italian at Venice in 1565. He wrote a full narrative of his life, which was published long after his death by Francisco de Andrada under the title of *Peregrinação de Fernão Mendes Pinto* (4to., Lisbon, 1614). Few books have been more popular. In Portugal editions were printed in 1678, 1711, 1726, and 1762. A Spanish translation by Francisco de Herrera, in which great liberties were taken with the original, appeared in 1620; a French translation was made by Bernard Figuier, of which 8 editions have been printed (Paris, 1628, 1645, and 1880), and an English translation by H. Cogan, of which there have been two editions (London, 1663 and 1692). Pinto's reputation in English literature has suffered greatly by an oft quoted line in Con-

grave's "Love for Love:" "Ferdinand Mendez-Pinto was but a type of thee, thou liar of the first magnitude!" But it is now admitted by critics and scholars that his general veracity cannot be disputed. The countries in which his adventures happened are still many of them little known, but the more they have been explored the more has the correctness of his statements become apparent. Rémusat, the eminent Chinese scholar, cites him as good authority for facts, and Malte-Brun remarks that in writing about eastern Asia he had carefully examined Pinto's work, and was strongly confirmed in his opinion of the reality of his adventures and the general correctness of his memory.

MENDICANTS, or **BEGGING FRIARS**, a class of monastic orders in the Roman Catholic church, the members of which were originally bound to have no property of their own, but to look for their support to the charitable contributions of the people. The first Mendicants were the Franciscans, established in 1210, and the Dominicans, established in 1216; but later several other orders were declared by the pope to be Mendicants, as the Carmelites in 1245, the Augustinian Hermits in 1256, and the Servites.

MENDIZABAL, JUAN ALVAREZ Y, a Spanish financier, born in Cadiz about 1790, died in Madrid, Nov. 8, 1858. He was the son of a small Jewish trader named Mendez, and by his business tact succeeded in 1808 in obtaining an employment in the victualling department of the French army in Spain. After the war he was for some time attached to a banking establishment in Madrid. In 1819 he procured funds for the revolutionary army, and after the reestablishment of the constitutional government he assisted the finance minister Arguelles in the negotiation of loans. On the downfall of that government he fled to England, where he was for some time imprisoned at the instance of some English capitalists whom he had induced to take parts of the loan. After the recovery of his liberty he founded, with the aid of funds deposited with him by a friend, a commercial establishment, which became prosperous. On occasion of some journeys to Portugal he formed the acquaintance of an agent of Dom Pedro, and succeeded in negotiating a loan for him in London. This and other operations secured for him an extensive reputation both in England and Spain, which in June, 1835, led to his appointment as minister of finance in the cabinet of Toreño; but he continued to reside for some time in London, where in August he negotiated a loan of £1,150,000 for the Spanish government. On his return to Madrid he was received with great favor, and his success in financial matters became a stepping-stone to political influence. He boasted of his ability to restore tranquillity in Spain within 6 months; he was appointed president of the council in place of Toreño; the cortes placed 100,000 men at his disposal, and gave him full authority to act to the best of his judgment in bringing the civil war to a close. But he injured the credit of the govern-

ment by jobbing transactions with the house of Ardoni, increased the public debt, dissolved the cortes (Jan. 27, 1836), insulted the French ambassador, Count de Rayneval, who opposed his influence, and failing in restoring order within the stipulated time, he was compelled to resign (May 15). His reappointment as minister of finance (Sept. 11, 1836) gave rise to great indignation, and on Aug. 10, 1837, he withdrew from office, together with the other members of Calatrava's administration. For several years afterward he sat in the cortes as a member for the province of Madrid. In 1841, under Espartero, he was again minister of finance, but his devotion to that leader compelled him to share his fate in July, 1848. He first fled to Portugal, and afterward to England, eventually taking up his residence in Paris, where his wealth enabled him to live in great splendor. In 1848 he was permitted to return to Madrid.

MENDOZA, a province of the Argentine confederation, extending along the E. declivity of the Andes from lat. 32° to 34° 38' S., bounded N. by the province of San Juan, E. by San Luis, S. by Buenos Ayres, and W. by the republic of Chili; pop. in 1855, 40,000. It is nearly of quadrangular form, being about 150 miles in length and breadth. The districts immediately bordering on the Andes are mountainous, and contain several volcanoes; but the greater part of the surface is level. The chief rivers are the Desaguadero, Mendoza, and Tunuyan. The climate is dry and healthful, though warm in summer. The soil, though in general sandy and barren, yields when irrigated abundant crops of wheat, maize, barley, fruit, and lucern. The most important mineral productions are silver, copper, slate, gypsum, alum, and medicinal salts. At Uspallata are mines of the first named metal which were formerly very profitable. The state is ruled by a governor elected by its legislature.—**MENDOZA**, the capital, is situated at the base of the Andes, 2,591 feet above the level of the Atlantic, in lat. 32° 58' S., long. 69° 6' W.; pop. from 10,000 to 12,000. It is a pleasant city, and noted for its salubrity. The houses are generally adorned with porticoes, and surrounded with gardens. The alameda, or public promenade, is nearly a mile in length, and sheltered throughout by rows of stately poplars. The principal buildings are the churches and convents. In the vicinity are numerous well cultivated vineyards.

MENDOZA, DIEGO HURTADO DE, a Spanish scholar, author, and statesman, born in Granada in 1508, died in Valladolid in 1575. Lope de Vega mentions that in his time the name of Mendoza had been "nobly great" for 23 generations, and the family sometimes claimed descent from the Cid himself. The 3 immediate ancestors of Diego were successively distinguished as the poet and wit of the court of John II., the ambassador of Ferdinand and Isabella to the see of Rome, and a Spanish general against the Moors, who became governor of Granada after its surrender. Diego was originally destined for

the church, and was educated in Latin, Greek, and canon and civil law at the university of Salamanca. There he wrote his *Lasarillo de Tormes* (Antwerp, 1558), which proves that he was interested rather in fictitious literature than in theology. It is a satirical romance, and became the foundation for the whole class of Spanish fictions in the *gusto picaresco*, which the *Gil Blas* of Le Sage subsequently made famous throughout Europe. The leading character is a dexterous rogue, who in the capacity of a servant sees the actors in all grades of society behind the scenes. The work was often reprinted, and provoked many imitations. After leaving the university, instead of entering the church, he served as a soldier in the Spanish armies in Italy, and when the troops were unoccupied listened to the lectures of the professors at Bologna, Padua, and Rome. In 1588 Charles V. sent him as ambassador to the republic of Venice, where Paulus Manutius dedicated to him an edition of the philosophical works of Cicero, and where he exerted himself for the collection of Greek manuscripts. He afterward became military governor of Sienna, and somewhat later was sent to maintain the imperial interests in the council of Trent, from which he was withdrawn in 1547 to proceed as a special plenipotentiary to Rome to confront and overawe Pope Julius III. For 6 years he was regarded as the head of the imperial party throughout Italy. He returned to Spain when the emperor changed his policy before abdication, and under Philip II. was not in favor and seldom went to court. In a passionate dispute with a courtier in the palace, the latter drew a dagger, when Mendoza wrested it from him, and threw it, and according to some accounts the courtier also, out of the window. He was in consequence banished from court, and solaced his exile by writing poetry and history. His poems display the old Castilian national tone of feeling and reflection, modified by his familiarity with the classical and Italian poets. His epistle to Boscan and hymn to Espinosa are equally marked by his Spanish genius and classical studies. A gayety worthy of the author of the *Lasarillo* appears in some of his *letrillas*. There is but one edition of his poems (Madrid, 4to., 1610), a rare and valuable book. His principal historical work is the *Guerra contra los Moriscos* (1568-'70), a record of the Moorish insurrection. It is esteemed one of the finest specimens of historical writing in the Spanish language, is in a picturesque and energetic style modelled after that of Sallust, and, notwithstanding his Spanish sympathies, is so impartial with respect to the enemies of his faith and people that it could not be published till long after his own death, the first complete edition being that of Monfort (Valencia, 1776). This was his last literary labor, and on finishing it he presented the whole of his library, including classics, manuscripts, and curious Arabic works, to the king for the palace of the Escorial. His life by Antonio is contained in the *Bibliotheca Nova*.

MENDOZA, INIGO LOPEZ DE. See SANTILLANA.

MENELAUS, one of the Homeric heroes, the son of Atreus and younger brother of Agamemnon, and king of Lacedaemon. After his wife, the beautiful but faithless Helen, had eloped with Paris, he and Ulysses proceeded to Troy to demand her restitution. In the war which followed the refusal he repeatedly distinguished himself, slaying many Trojans in single combat. He also engaged Paris, and would have killed him had not Venus interfered and enabled her favorite to escape. Menelaus was also one of the warriors concealed in the wooden horse, whose introduction into the city led to its capture and destruction. On recovering Helen he embarked for home; but when he arrived off the Maleian coast Jupiter sent a storm which scattered his fleet, and drove the ship that bore him and Helen as far as Egypt. With the exception of Ulysses, he was the last of the Hellenic heroes that reached Greece. His latter days were passed in peace and prosperity. He was the father of several children by Helen.

MENES. See EGYPT, vol. vii. p. 86.

MENGES, ANTON RAPHAEL, a German painter and writer on art, born in Aussig, Bohemia, March 12, 1728, died in Rome, June 29, 1779. His father, a miniature painter of very moderate ability, having determined to make an artist of him, took him when a child to Dresden, and compelled him to pursue his art studies without relaxation. Young Menges, however, threw so well under this severe treatment, that in his 8th year he designed a subject from the *Æneid*, and at 14 was a skilful painter. In 1741 his father took him to Rome, and compelled him to devote nearly his whole time, with the exception of the few hours given to sleep, to the study of the works of Raphael and the old masters in the Vatican, of which he made several copies in miniature for Augustus III. of Poland and Saxony. Returning to Dresden at the end of 8 years, he was appointed court painter to Augustus, with permission to return to Rome. During his second visit to that city he established his reputation by a holy family, the figure of the Virgin in which was painted from a beautiful peasant girl, whom he subsequently married. In 1749 he was compelled by his father to return to Dresden, but during the next few years the tyranny of his parent became so intolerable that his health and spirits suffered, and he obtained the permission of the elector to return to Rome. His talents began to be developed rapidly, and among the works which he executed in the next few years were a copy of Raphael's "School of Athens" for Lord Percy, afterward duke of Northumberland, the frescoes in the church of San Eusebio, and those of "Apollo and the Muses on Parnassus" in the Villa Albani, which have been engraved by Raphael Morghen. About this time he attracted the notice of the king of Naples, who, upon succeeding to the throne of Spain as Charles III., invited him in 1761 to Madrid. He executed a number of

works in the royal palace of that city, including his "Aurora;" but was finally compelled by ill health to return to Rome. On a second visit to Spain he painted in the grand saloon of the palace at Madrid his fresco of the "Apotheosis of the Emperor Trajan." Failing health, caused by unremitting devotion to his art, compelled him again to resort to the more genial climate of Italy. Stopping at Monaco on his way to recruit, he painted there his picture of the "Nativity." The king valued this work so highly that he caused it to be covered for protection by a glass plate 9 feet 10 inches by 7 in dimension. He died soon after his arrival in Rome of despondency at the loss of his wife. His merits have been much exaggerated by his friends, particularly Winckelmann, who ranked him higher than Raphael, and quite as much underrated by others. As a theorist and writer on art he is still a standard authority, and his remarks on the antique and criticisms of the works of the old masters were highly esteemed by the artists of his own age as well as by Winckelmann, Lanzi, and other eminent critics and historians of art. His writings were published in Rome in 1783, and have been translated into various European languages.

MENG-TSÉ. See CHINESE LANGUAGE and LITERATURE, vol. iv. p. 127.

MENHADEN, a North American fish of the herring family, and genus *aloa* (Ouv.), which differs from the herrings (*clupea*) in having a deep notch in the centre of the upper jaw. This fish (*A. menhaden*, Storer), called also hardhead and mossbunker by the New York fishermen, varies in length from 8 to 14 inches; the color above is greenish brown, darkest on the top of the head and at the snout; upper part of sides roseate with indistinct bluish mottlings, disappearing after death; abdomen silvery, gill covers cupreous, a more or less distinct black spot upon the shoulders, and the whole surface iridescent. The body is elongated and compressed, the gill covers very large, eyes moderate, gape large, and lower jaw the shorter. This species comes into Massachusetts bay in May, and departs in November; great quantities are taken in nets around the outer islands of Boston harbor during the night; sometimes 100 barrels are taken at one haul, and such as are not ground up for bait are sold for food at about half a cent each; being rather oily, they are not very palatable, but on this account make excellent manure. A single menhaden of common size is considered equal in richness to a shovelful of barnyard manure; in some parts of Cape Cod they are sold at \$1 a thousand, and 2,500 are considered as sufficient for an acre of land; the odor arising from their decomposing bodies is sometimes almost unendurable. The oil is also of value; in 1845, 400 or 500 barrels were obtained at the Elizabeth islands by grinding up these fishes by machinery; it is used by painters, and is considered preferable to linseed oil. The number of barrels inspected has varied from a very few to

more than 2,000, this species being much more numerous on the coast in some years than in others. They are found from the British provinces to the coast of New Jersey, swimming in countless numbers near the surface, and attended by sharks, blue fish, gulls, and other predaceous species. They are never found in fresh water, being an exclusively marine species.

MENINGITIS, TUBERCULAR. See HYDROCEPHALUS.

MENIPPUS, a cynic philosopher, originally a slave, a native of Gadara in Syria, lived toward the close of the 3d century B. C. He amassed great wealth by usury, but, having been cheated out of it all, committed suicide in despair. He was the author of 18 treatises, all of which are lost. His works contained nothing serious, but abounded in jests and sarcasms. Lucian, in his "Dialogues of the Dead," makes Diogenes describe him as an old bald-headed man, in a tattered cloak, incessantly ridiculing the pedantry of his brother philosophers.

MENNO SIMONIS, a reformer of the 16th century, after whom one of the religious denominations which arose at that time was called Mennonites, born at Witmarsum, a village of Friesland, toward the end of the 15th century, died Jan. 13, 1561. Little is known of his personal history. In 1524 he was a priest in the village of Pingium. Doubts as to transubstantiation and other doctrines of the Roman Catholic church led him early to the writings of Luther. In 1531 his religious life received a powerful shock, when he witnessed in the neighboring town of Leeuwarden the beheading of one Sicke Snyder, who was put to death for having been rebaptized. Henceforth he was gradually led to the conviction that pædobaptism was untenable. His external connection with the Roman Catholic church was not broken off until 1535, when an Anabaptist movement was put down by force, and Menno's brother lost his life. He then declared himself openly in favor of a reformation of the church, but at the same time issued a polemic work against the views and errors of John of Leyden. The life of Menno after he had left the Roman Catholic church was one of great hardships. Driven into exile and threatened with death, he had to struggle for 25 years with poverty and want of every kind. He became teacher and bishop at Groningen, and formed congregations in Friesland and throughout western and northern Germany. The last years of his life were embittered by grave dissensions among his adherents concerning the nature of the ecclesiastical ban. They ended with the exclusion of the milder party from the church, although the sympathies of Menno were supposed to be with them. He died at Oldeslohe, in Holstein, where he had found an asylum and obtained permission to print his writings. His principal work was the "Fundamental Book of the True Christian Faith" (1539); his complete works, nearly all written in the Dutch language, were published at Amsterdam in 1681.

MENNONITES, a denomination of Baptists, first organized in Holland by Menno Simonia, after whom they were also called, although it is still doubtful whether they were founded by him. The prevailing opinion among church historians, especially those of Holland, is, that the origin of the Dutch Baptists can be traced to the Waldenses, and that Menno merely organized the concealed and scattered congregations as a denomination. For a long time they had to suffer in Holland from the national prejudice, which confounded them with the fanatical Anabaptists; and they found the less sympathy as their rejection of paedobaptism and of the oath separated them so widely from the vast majority of European Protestants. At last they found a protector and advocate in William of Orange, and in 1581 they were permitted to hold an assembly of the representatives of 12 different congregations. The degree of toleration which was granted to them varied, however, in different provinces, and it was not until 1672 that they obtained full liberty of worship. They suffered from internal dissensions, which commenced in the lifetime of Menno and increased after his death, quite as much as from external oppression. They were first divided into a rigorous and a moderate party, both of which were afterward subdivided into a number of smaller parties, which frequently combated each other with animosity. Hugo Grotius, who calls them Anabaptists, remarks that their divisions were so numerous that they could scarcely be numbered. In the 17th and 18th centuries the number of Mennonites in Holland greatly increased in consequence of the immigration of fugitive Mennonites from Germany and Switzerland, and it was estimated, toward the middle of the 18th century, at about 160,000. Since that time they have again considerably decreased. An important event in their history was the establishment of a theological seminary in 1785, which gave them an educated ministry, and gradually removed the barriers which had separated them from the other Protestant denominations. In 1795 they received the same rights as other denominations; and soon after they began gradually to drop the points of difference by which they were divided into a number of sects, and to unite into one denominational body. Their relation to most of the other denominations became at the same time so amicable that they could unite with them in general Bible and missionary societies. More recently the study of theology has made so great progress among them that some of their theologians, as Dr. Van Gilse and Dr. Hoekstra, are counted among the most distinguished theological authors of Holland. They have a foreign missionary society, which sustains one mission with three missionaries in Java. Teyler's theological society at Haarlem is a Mennonite institution. According to the Mennonite "Year Book" of 1850 (the last published by the denomination) they had then in Holland about

127 congregations and 140 ministers.—In Germany they were very numerous in the 17th century, when in Moravia alone they were supposed to amount to 70,000. But almost incessant persecution greatly reduced their number, and it was not until the revolution of 1848 that most of the German states granted them full civil rights. Since then they have again been deprived of some rights in several German states, as in Hanover, which in 1858 annulled the election of a representative of the second chamber because he was a Mennonite. Among the most distinguished German Mennonites is H. von Beckerath, in 1848 minister of finance of the German empire. Toward the close of the 18th century several thousand German Mennonites found a quiet retreat in the south of Russia, and obtained a charter from the emperor Paul, granting them freedom from military service for ever. Their number has since rapidly increased in consequence of continued immigration.—In the United States the Mennonites settled as early as 1688, in and about Germantown, Penn., where they erected a school and meeting house in 1708. In 1709 other families from the Palatinate settled in Pequea Valley, Chester, now Lancaster co., Penn. As their religious views were but little known and frequently misrepresented, they had the Dutch "Confession of Faith" translated into English and published in Philadelphia in 1727. They have since spread over a large portion of Pennsylvania, and are also found in Maryland, Ohio, Indiana, New York, and Canada.—In 1811, a number of Mennonites seceded from the main body, which they considered as having fallen off from the original faith, and founded the Reformed Mennonite society. Another body of rigid Mennonites are called the Omish or Amish church, after Jacob Amen, a Mennonite preacher of Switzerland in the 17th century, as also Hooker Mennonites, because they wear hooks on their clothes instead of buttons.—The numbers of the Mennonites were, in 1859, according to the leading Mennonite journals, as follows: America, 128,000 souls; Netherlands, 89,726; Russia, 28,770; Germany, 17,716; France, 5,000; Switzerland, 3,000; Java, 25; total, 222,287. A confession of faith, which is still regarded by the Mennonites as their standard, was adopted at Dort in 1682.—In doctrine and usages they agree in general with the other Baptist churches. But, like the society of Friends, they are utterly averse to oaths, to war, and to capital punishment, which they regard as inconsistent with the spirit of Christianity. They also differ from the other Baptists in the mode of baptism, as they generally baptize by sprinkling, not by immersion. They plead for this usage the authority of Menno, but the correctness of this assertion has been denied by the writers of other Baptist denominations. They observe the ordinance of foot-washing, and forbid their members to be married to any except those who have been united to the church.—A general history of the Men-

nonites is still wanting. The most important work on their history in Holland is that of Blanfot ten Cate, *Geschiedenis der Dooptegesinden in Friesland, Groningen, Overijssel en Oostervriesland, Holland, &c.*

MENOBRANCHUS, or PROTEUS OF THE LAKES, a batrachian of the order *amphipneusta*, and of the division of perennibranchiate amphibia, so called because the gills are persistent and external; the order includes also the *proteus* of Europe, the axolotl, *amphiuma* or Congo snake, *menopoma* or hell-bender, and *siren* or mud eel of the United States. In the genus *menobrancheus* (Harlan) or *necturus* (Raf.), the head and mouth are large; the upper jaw with a series of small sharp-pointed teeth, the palate also similarly armed; neck contracted, with 8 branchial tufts on each side; tail compressed laterally and fringed with a delicate membrane; limbs 4, each 4-toed; eyes small and without lids; the lips are thick and fleshy; the tongue is large, entire in front, and movable only at the tip and anterior edges; nostrils small and near the margin of the upper lip; the body elongated and sub-cylindrical, covered with a smooth skin; toes without nails. The best known species is the spotted menobranche (*M. maculatus*, Barnes), about 12 inches long, of a cinereous dusky gray, with sub-circular darker spots, and a brown stripe extending from the snout over the eyes; it is found in the great lakes of North America and in Lake Champlain, and in the streams opening into them. A species described as *M. hyemalis* in the "Proceedings of the Boston Society of Natural History" (vol. vi., 1857), from Portage lake, a tributary of Lake Superior, may be a variety of the above. In *M. lateralis* (Say) the color is dusky brown above, with a dark band from the nostrils through the eye and along the sides to the tail, and dirty flesh-colored below; the form is more slender than in the other species; it is found only in the western waters running into the Mississippi, especially if not entirely on its eastern side, from Pennsylvania to Tennessee. In many specimens kept alive by the writer, some of them for 8 or 4 years, obtained from Portage lake, the gills, 8 in number on each side, were provided with an immense number of very delicate fringes, of a deep red color when the animal was actively breathing, which were kept waving to and fro in a most graceful manner during respiration, like a lady's feather fan; the 4 limbs, about an inch long, were set almost at a right angle, and the gait was consequently very awkward; the movements executed by the tail are rapid and graceful; the vent is longitudinal; the general aspect of the head is snaky and forbidding, and they are considered by the Indians, though doubtless erroneously, as venomous. The specimens above mentioned were very tenacious of life, having been imprisoned under ice half an inch thick every night for 8 months without apparent injury, and ate nothing for 6 months except what they obtained from the water; they often come to the surface to swal-

low air, which is emitted at the gill opening in bubbles accompanied by a faint squeak. Generally sluggish in their motions, and avoiding the sunlight, they seize living worms eagerly, sucking them down if small at a single gulp, or, if large, by repeated efforts; the sight is not very good, and they rarely snap at their prey unless it touches their mouth. They are sometimes taken on hooks by persons angling for mud fish; they are most active at night, moving rapidly at this time, and often throwing themselves nearly out of water; they feed on insects, worms, small crustaceans, and other living prey. The gills when inactive shrink, and become of a slaty gray color; they are cleansed from impurities by means of the fore feet. When the branchial fringes are lost by accident (*op. cit.*, p. 428), the animals do not appear to suffer; they have rudimentary lungs or pulmonary sacs, which assist in respiration by means of the swallowed air; but these are not sufficient of themselves to support life, as the animals die out of water in about 4 hours; with the cutaneous respiration, active in all amphibians, the air sacs are able to purify the blood. These animals, having both lungs and gills, though the former are insufficient to prolong life except for an hour or two, probably come as near as any to the fabulous amphibians able to live in water or air.

MENOPOMA, a North American tailed batrachian reptile, one of the series of animals which seem to connect the perennibranchiate amphibians with the salamanders. The genus *menopoma* was established by Harlan in 1825, though Leuckhardt had in 1821 formed the genus *cryptobrancheus*. The generic characters are: large and flat head; upper jaw with 2 concentric series of minute teeth, the inner the less extensive, lower jaw with a single series; a single branchial orifice on each side; branchiae rudimentary and evanescent; extremities 4, the anterior with 4 fingers, the posterior with 5, short and palmated; skin loose and folded on the sides of the body. The common *menopoma* (*M. Alleghaniense*, Harlan) attains a length of about 15 inches, of which the head is $1\frac{1}{2}$ and the body 9; the large mouth is provided with thick lips, and the snout is full and rounded; the nostrils anterior and very small, the eyes minute and black; no cutaneous fold at the throat; body stout and thick, the vent a circular fringed orifice; tail large, much compressed laterally, with a rayless cutaneous fin along the upper border. The color is said by De Kay to be pale slate, mottled with dusky. It lives in fresh water, and is carnivorous and voracious, feeding on fish, worms, and mollusks; it is found in the Alleghany river and its tributaries, and many of the branches of the Ohio and Mississippi; its most common name is "hell-bender." Dr. Holbrook describes another species (*M. fuscum*), from western South Carolina, of a brownish color above and yellowish white below; both species have the limbs more or less fringed posteriorly.—Van der Hoeven

places the gigantic salamander of Japan in the genus *cryptobranchus*, under the name of *C. Japonicus*. This animal, the largest of the known naked amphibia, growing to a length of more than 8 feet and to a weight of nearly 20 lbs., was discovered by M. Siebold, who had several specimens alive, and one for many years in Europe. The form is robust; the tail occupies about $\frac{1}{4}$ of the length, and constitutes the principal organ of locomotion, assisted by a loose fold of skin extending from the head along the sides to the origin of the tail; the lips are not very distinct, and the tongue is small; the occiput is separated from the neck by two wide protuberances formed by the muscles of the jaws; the skin above is covered with numerous rough prominences, which give it a very forbidding appearance; the color is dark brown, with wide blackish spots. Van der Hoeven maintains that this is not distinguished from *menopoma* by any generic character; it resembles the latter in form, habits, bones of the skull, number of vertebrae (20 in the trunk and 24 in the tail), sternum, pelvis, ribs, and extremities; the bones present cavities opening externally; there is no gill aperture, and the branchiae disappear early. It is slow in its movements, remaining quiet at the bottom of the water, rising to the surface every 5 or 10 minutes to breathe air both by the nostrils and the mouth, but able to remain half an hour under water without renewing the contents of the lungs; generally inoffensive, it will bite severely when irritated; it is voracious, feeding upon fish, frogs, insects, and even its own species, which it seizes with a sudden movement of the head; after eating, it generally fasts a week or two, and it is less voracious in winter than in summer; it is able to endure extremes of heat and cold, and has a remarkable power of reproducing lost parts; on land its motions are very awkward and slow. This species is confined to the lakes and streams of the high mountains of Nippon, between lat. 84° and 86° N., and to some other parts of Japan and parts of China; it is employed by the native physicians, in the form of food, as a preservative against contagious diseases and as a remedy in pulmonary complaints. The remains of the gigantic salamander found in the tertiary fresh water formations of Eningen, formerly regarded as fossil human bones, the *homo diluvii testis* of Scheuchzer, are referred to this genus by Van der Hoeven, under the name of *C. primigenius*; in size, form, and structure it comes near to the Japanese species, and is one of the most interesting of the antediluvian animals which inhabited the fresh waters of Europe. The famous footprints of Hildburghausen, Germany, on which was established the *cheirotherium* of Dr. Kaup, have also been referred to a similar salamandroid batrachian. (See LABYRINTHODON.)—Another batrachian which deserves mention here, having been omitted in its alphabetical order, is the *amphiuma* or Congo snake of the American negroes. The general aspect is eel-

like, the head large, the lips thick and extensive, the snout depressed and rounded, neck contracted with a transverse fold at the throat; numerous small teeth on the maxillary and palate bones; a single spiracle on each side of the neck; limbs 4, the anterior very small, with 2 fingers, and the posterior still smaller, with 2 toes. This description answers to the *A. means* (Garden), found in the southern and south-western states, and attaining a length of 28 inches, of which the head is 2 and the tail 6 inches; the color is deep bluish black above, with a violet tinge, the lips and throat lighter, and the under surface dark purple. Though the branchial apertures are persistent, the gills disappear early in life. They live in muddy waters or in the mud, burrowing like worms in the ditches of the rice fields, and feeding on small fish, mollusks, and insects; they are sometimes found on land, apparently seeking a favorable locality. They are considered by the southern negroes as highly venomous, but without any foundation in truth. In the *A. tridactylum* (Cuv.), the anterior fingers are 3, and the posterior also 3; the different number of fingers is the principal distinction between this and the other species; it is found in the south-western and perhaps in some of the middle western states of America.

MENSES. See CATAMENIA.

MENSURATION, the art of measuring things which occupy space; that is, of determining the ratio which given quantities in space bear to some quantity selected as a unit. This is the art which led to the formation of the science of geometry; and some schools of philosophy are inclined at the present day to limit the whole domain of mathematics to the field of mensuration, but extending this field so as to include time as well as space. The art is, however, partly mechanical as well as mathematical, and even in its mathematical part is but the application or illustration of sciences that in their purity have no connection with material things.—There are 3 kinds of quantity in space, viz., length, surface, and solidity; and there are 3 distinct modes of measurement, viz., mechanical measurement, geometrical construction, and algebraical calculation. For the last two modes arithmetical computation is a necessary adjunct; for the ratio to a unit quantity can be definitely stated in particular cases only as a numerical ratio. Lengths are measured on lines, and the measure of the length of a line is the numerical ratio which the line bears to a recognized unit of length, the inch, foot, or mile, determined in England and in this country by reference to brass rods 3 feet in length kept by the government as standards. The mechanical mode of determining lengths is called direct measurement. Rods are directly compared with the standard, and accurately made of the same length, and these rods, "rules," or yard sticks, or else tapes and chains accurately graduated by direct comparison with such rules, are stretched side by side with the line to be meas-

ured, and the ratio observed. When the line is long and the rule is applied many times consecutively, the slight errors arising at the joining of the successive positions of the rod, being multiplied, become of serious practical importance. In geodesy, therefore, when base lines several miles in length are to be accurately determined by direct measurement, the rods are made capable of a microscopic adjustment at the ends, and allowance is made for their expansion by heat. (See COAST SURVEY.) When the line is long, or when it is inaccessible, the length is usually measured by the second or third mode.—The measurement of a line by geometrical construction is effected by the direct measurement of accessible lines and angles in a figure, of which the line to be measured forms a component part, and then drawing this figure upon paper, on a definite scale of a certain number of feet to the inch. The direct measurement of the unknown side upon the paper will evidently give the length of the line represented by it. Thus, if one ship has sailed 50 miles E., and another from the same port 100 miles 80° E. of S., and we wish to know their distance apart, we may draw a line one inch in length and a line half an inch in length, making an angle of 60° with each other, and we shall find their extremities separated by .866 of an inch, showing the ships to be 86.6 miles asunder. (It will be noticed that we do not include angles among quantities in space. Strictly an angle is a quantity, since it can be measured, and its measurement is necessary at times for the measurement of other quantities. But the measurement of angles is not, in the general use of language, included among the direct objects of mensuration.) The measurement of a line by algebraic computation is effected as in geometrical construction, except that instead of drawing the figure we calculate the length of the unknown side from the known relations of the sides and angles of figures, and from tables giving numerical values for those relations in right triangles, into which all plane figures can be divided at pleasure. It is, in practice, easier to measure angles with great accuracy than long lines, and hence in geodesy only one base line is actually measured, while all the other distances of the survey are computed from the measurement of the angles in a network of triangles.—The second kind of quantity to be measured is surface. The area of a surface is its numerical ratio to a square surface whose side is a linear unit, that is, to a square foot, square inch, &c. This sort of measurement is never done directly or mechanically, but always by the measurement of lines, and generally by the use of the geometrical propositions, that all surfaces may be resolved into triangles, all triangles are equivalent to the halves of rectangles having the same base and altitude, and that the area of a rectangle may be found by multiplying the number of units in its length by that in its breadth. The reduction of all surfaces to subjection to these

propositions requires sometimes so much labor, that in surfaces of a more intricate form use is made of algebraical laws and of the differential calculus, according to the fundamental idea of fluxions, that a surface is generated by a moving line which constitutes, in two positions, two of the boundaries of the surface. Thus a circle may geometrically be considered as composed of an unlimited number of triangles with their bases on the circumference and their vertices in the centre; or it may be considered algebraically as generated by a chord sweeping across it, beginning of no length, swelling to a diameter through the centre, and contracting again to zero. Either of these modes of viewing it leads to the same area of the circle, viz., the product of its circumference by half its radius, or, what is the same thing, .78539 of the square enclosing it.—The third species of quantity is solidity. The unit of measurement is here either a cube whose edge is a linear unit, or else it is an arbitrary number of cubic inches selected from historic reasons as a unit, such as the bushel of 2,150 inches, or the gallon of 281 inches. The direct or mechanical measurement of solidity is applied to liquids, or to solids separated into parts so small as to be handled somewhat in the manner of a liquid, as coals, for example, are poured from a basket. This direct measurement consists then in simply filling a vessel of known capacity with the article to be measured, repeatedly, until all is measured. The geometrical and algebraical modes of measuring solidity will be understood from the analogous modes of measuring lines and areas. They are principally based on the doctrines, that the solidity of a right parallelepiped is found by multiplying the area of its base by its altitude; that a pyramid has one third the solidity of a parallelepiped of the same base and altitude; and that every solidity by sufficient ingenuity can be divided into pyramids and parallelepipeds. But in intricate cases it is easier to use fluxions, and consider the solid generated by the motion of a surface through it; a hemisphere, for example, might be considered as an unlimited number of pyramids with their apices at the centre, or as generated by the circular plane of its base, diminishing as it rose to the summit of the hemisphere, and there becoming zero. In practical life, mechanics use arithmetical rules or formulas derived from considerations such as we have here presented. The cask or barrel, for example, is treated as though one of several varieties of geometrical solids, and rules given for discovering its solidity on those suppositions. The gauge rod is marked with the number of gallons which a cask of certain form (about the average form of barrels) would have if its diagonal distance from the centre of the bung to the inner end of the staves were the same as from the end of the rod to the spot where that number is engraved; and thus by thrusting the rod diagonally into the bung hole of any ordinary cask, the number of gallons it contains is readily determined. The

tonnage of ships is computed in the same way by assuming the figure of the ship to be of a certain model, and the tonnage is under or over estimated according to its departure from this average form. Many little works have been published containing only practical rules without explanation, all essentially alike. In particular cases, ingenuity may devise particular modes for measuring the solidity or the area of very complicated figures; the earliest example is that of Archimedes determining the solidity of Hiero's crown by plunging it into water to discover how much of the fluid it displaced.

MENTCHIKOFF. I. ALEXANDER DANILOVITCH, prince, a Russian statesman, born in Moscow about 1672, died in Beregov, Nov. 2, 1739. The son of poor parents, he was brought up without education, and apprenticed to a baker; but having attracted the attention of Lefort, the favorite of Peter the Great, he entered the service of that prince, and subsequently commended himself greatly to his patron's favor by discovering a conspiracy among his guards. He served in the campaign of Azof, accompanied the czar to Holland and England, and on the death of Lefort became his principal adviser, being equally active in preparing or executing the great schemes of national reform, and in the warlike and diplomatic operations against Charles XII. Created field marshal and prince by his master, and prince of the German empire by Leopold I., he also repeatedly officiated as regent in the absence of Peter. During the campaign of 1706 he gained the decisive battle of Kalish over the Swedes, and in 1709 he greatly contributed to the victory of Pultowa, in consequence of which Charles fled to Turkey, and his general Lewenhaupt surrendered to Mentchikoff. In the following year he commanded the Russian forces in the north, took Riga, occupied Pomerania and Holstein, and conquered Stettin. Numerous arbitrary acts, however, the main spring of which was the prince's unbounded cupidity, finally drew upon him the wrath of Peter, who subjected him to a court martial. He was sentenced to death, but escaped with a heavy fine. He regained his influence under Catharine I. (1725-'7), of whose accession to the throne he was the principal instrument, and till her death exercised full sway over Russia. He was, if possible, still more powerful at the beginning of the reign of the young Peter II., whose father-in-law he was about to become when he was suddenly overthrown by Dolgoruki (Sept. 1727), and banished with his family to Siberia. He first bore his misfortunes with great firmness, but the loss of his wife and eldest daughter broke his spirit, and hastened his death. The remaining members of the family were recalled by the empress Anna. II. ALEXANDER SERGEYEVITCH, prince, great-grandson of the preceding, and Russian admiral, born in 1789. He entered the imperial service in 1805, was for some time attached to the embassy at Vienna, accompanied Alexander I. as aide-de-camp during the campaigns of 1812-

'14, and was subsequently promoted to the rank of general, but resigned in 1823, together with Capo d'Istria and others, when the czar definitively abandoned the cause of the struggling Greeks. Under Nicholas he served as ambassador in Persia, as well as in the war with that country which broke out on his return, and soon after in the Turkish war of 1828-'9. He took Anapa, but was seriously wounded before Varna, and subsequently devoted himself to the restoration and development of the Russian navy, being successively appointed governor-general of Finland, admiral, and minister of the marine (1836). Toward the close of the same reign he was sent to Constantinople, with an imposing suite, to urge the claims of Nicholas in the affairs of Turkey (March, 1853). His extravagant behavior, as was anticipated, promoted a speedy rupture, the prince returned to Russia, and war was declared. The first victory of the Russians over the Turkish fleet at Sinope may have been in part the result of Mentchikoff's previous reconnoitings in Turkey. Commanding both the land and naval forces in the Crimea, he lost the battle of the Alma, but succeeded in strengthening the fortifications of Sebastopol, sacrificed a part of the fleet to bar the entrance of the harbor, and, though he lost another battle at Inkermann, distinguished himself by the utmost energy in defence of the fortress. He was, however, superseded in March, 1855, by Gortchakoff, and appointed by Alexander II. commander of Cronstadt. He is counted among the staunchest members of the national or old Russian party, and is regarded as opposed to reforms.

MENTOR, son of Alcimus, and friend of Ulysses, who intrusted to him the care of his house on his departure from Ithaca. To him fell the care of young Telemachus, and Minerva assumed his form in accompanying the latter on the journey in search of his father, acting the part of a wise counsellor to him. The name is metaphorically applied to any sage adviser or monitor.

MENTZ (Ger. *Mainz*; Fr. *Mayence*), a town of Hesse-Darmstadt in the province of Rheinhesen, and the most considerable fortress of the German confederation, situated on the left bank of the Rhine, nearly opposite its junction with the Main, connected by a bridge of boats nearly 1,700 feet long with the opposite village of Castel, and within a few miles of the watering place of Wiesbaden; pop. about 38,000, exclusive of the military. The finest squares are the Parade-Platz and the Gutenberg-Platz, the latter containing Thorwaldsen's statue of Gutenberg, who was born in Mentz. The cathedral is of great antiquity, and contains monuments of St. Boniface, the apostle of Germany, and of many of the archbishops of Mentz; a monument modelled by Schwanthaler was erected in 1848 by the ladies of Mentz in honor of the minstrel Meissen, called Frauenlob, who had made the praises of the ladies the theme of his songs. The other principal churches are those of St.

Stephen and St. Ignatius. The old electoral palace contains a fine museum of Roman antiquities and other artistic and scientific collections, including the famous astronomical clock by Alexius Johann, and the town library of upward of 90,000 volumes, comprising many ancient MSS. and the first psalter printed by Gutenberg. The grand ducal palace, originally the house of the Teutonic order, was for some time the residence of Napoleon I., and is now occupied by the military governor. The town possesses an excellent gymnasium, originally a university, and a number of other educational and charitable institutions; also an arsenal, a theatre, public gardens, and environs celebrated for their magnificent scenery. During the summer months Mentz is thronged by tourists. The manufactures consist of leather, tobacco, hardware, furniture, soap, pianofortes, carriages, &c. The chief articles of trade are wine, corn, and timber. The celebrated sparkling hock is made in Mentz. The opposite village of Castel is included in the system of fortifications. Its means of defence consist of 4 strong forts, beside the fortified island of Petersau. Exclusive of Castel, the extent of the fortifications of Mentz, comprising the citadel and other strong works, is 5 miles; but the united works of Castel and Petersau are of still greater extent, rendering the place a chief bulwark against French invasion, and one of the most important fortresses of Europe. The united works consist of 14 large and 13 smaller bastions. On the land side are 4 gates with double draw-bridges, beside a number of gates on the river side. In times of peace the garrison consists of about 10,000 Austrian, Prussian, and Hessian troops; in times of war at least 30,000 men are required. The military governor holds office for 5 years, and is alternately an Austrian and a Prussian general.—Mentz is of remote antiquity, and has remains of a Roman aqueduct and a monument of Drusus, who is said to have founded the fortress of Moguntia or Moguntia-oum on the side where Castel now stands. The town which sprung up near it was enlarged by Charlemagne. The most important epoch of its history commenced with St. Boniface, the apostle of Germany, in the 8th century, who was archbishop of Mentz. In the 18th century Mentz stood at the head of the league of the Rhenish towns. In 1486 it was annexed to the electorate of Mentz. During the 30 years' war the fortress was successively taken by the imperialists, Swedes, and French. In 1793 it fell by treachery into the possession of the French general Custine, but was reconquered by the Prussians under Kalkreuth, July 22, 1798. By the peace of Lunéville (1801) it was allotted to France, and by the congress of Vienna to the grand duke of Hesse-Darmstadt, but the fortress was assigned to the German confederation. The powder magazine of the fortress blew up Nov. 18, 1857. This terrible explosion involved a great loss of life and property, one entire street having been completely destroyed; the

damage was estimated at upward of \$1,000,000.—The former electorate of Mentz, founded at the end of the 10th century, comprised a population of upward of 200,000, and played an important part in the ecclesiastical and political history of the German empire, particularly during the reformation. Several of the electors gained great distinction, particularly Archbishop Albert in the 16th century. The last of them, Frederic Charles of Erthal, died in 1802.

MENU, or MANU. See BRAHMA.

MENZEL, KARL ADOLF, a German historian, born in Grünberg, Lower Silesia, Dec. 7, 1784, died in Breslau, Aug. 19, 1855. He studied at Breslau and Halle, officiated for many years as professor until 1824, and afterward took a prominent part in the official supervision of education in Silesia. He wrote *Geschichte Schlesiens* (3 vols., Breslau, 1807-'10); *Die Geschichte der Deutschen* (8 vols., 1815-'23); and *Geschichte unserer Zeit seit dem Tode Friedrichs II.*, a continuation of Becker's universal history (2 vols., Berlin, 1824-'5). His *Neuere Geschichte der Deutschen von der Reformation bis zur Bundesacte* (15 vols., Breslau, 1826-'54), is the most remarkable of his productions. In politics he favors monarchical institutions, provided they are in harmony with the progressive spirit of the age. Among his later works is a *Staats- und Religions-Geschichte der Königreiche Israel und Juda* (Breslau, 1853).

MENZEL, WOLFGANG, a German critic and author, born at Waldenburg, Silesia, June 21, 1798. He is the son of a physician, served in the war of 1815, subsequently attended the universities of Jena and Bonn, officiated for 2 years as teacher in Switzerland, and in 1825 removed to Stuttgart, where he became connected with the publishing establishment of Cotta, and where he continues to reside. His writings include poetry and fairy tales, some of which, as the famous *Rübezahl*, have been translated into English and other foreign languages. He has also written a *Geschichte der Deutschen* for the use of schools and general readers (3 vols., Zürich, 1824-'5, translated into English by G. Horrocks, 3 vols., London, 1849); and more recently a *Geschichte Europas von 1789-1815* (2 vols., Stuttgart, 1853). His travelling sketches display a keen insight into character, and the Viennese have nowhere been described with greater fidelity than in his *Reise nach Oesterreich*. His *Furor* (8 vols., Leipzig, 1851) is a novel which contains graphic delineations of the 30 years' war; and in the same year appeared his *Gedänge der Völker*, a collection of popular lyrics of all nations. Beside the above works and a number of others on various subjects, he has prepared an excellent manual of the history of the present century, and edited for many years past the *Literaturblatt*, which ceased to appear after the revolution of 1848; but Menzel resumed the editorship in 1852, and it has since been an organ of reactionary policy in civil and ecclesiastical affairs.—Notwithstanding his prodigious literary activity, Menzel is

chiefly celebrated as a polemical writer. In his *Deutsche Literatur* (2 vols., Stuttgart, 1828; translated into English by C. O. Felton, in Ripley's "Specimens of Foreign Literature," Boston, 1840) and other works he unsparingly attacks many German writers, and also assails the artificiality of Goethe's school as well as that of Voss. After the revolution of July, 1830, he came forward as a bitter opponent of French political and literary influence in Germany. His fierce dogmatism was castigated by Börne in his *Menzel der Franzosenfresser* (Paris, 1837). He has been a member of the Württemberg legislature.

MEPHISTOPHELES, the familiar spirit of the magician Faust, the second of the fallen archangels, and the most powerful chief of the infernal legions after Satan. The name occurs in mediæval legends, and is perhaps derived from the Greek $\mu\eta$, not, $\phi\omega$ s, light, and $\phi\iota\lambda\omega$ s, loving. He is chiefly known as the malignant, scoffing, and relentless fiend of Goethe's "Faust."

MEQUINEZ, or MEKNAZA, a city of Morocco, in the province of Fez, near the Leboo, 30 m. W. S. W. from Fez; pop. about 50,000. It is situated in a large and fertile plain, and is surrounded with walls. The houses are in general only one story high, but are neat and well built. The principal edifice is the extensive palace erected by Sultan Muley Ismael, and occasionally the residence of the sovereign. It is built of marble, and is adorned with fountains and fine gardens. There are manufactures of painted crockery, leather, &c. In the vicinity are large plantations of olives. There is an extensive trade at Mequinez in most of the products of the country.

MERCATOR, GERARD, a Flemish geographer and mathematician, born in Roermond, March 5, 1512, died in Doesburg, Dec. 2, 1594. He was patronized by the emperor Charles V., and in 1559 was appointed cosmographer to the duke of Juliers and Cleves. He published from time to time descriptions and maps of Europe, France, Germany, the British isles, and the world. His method of laying down charts and maps, by a projection of the surface of the earth *in plano*, is still in use, and bears his name. (See MAP.) The most important of his works are: *Chronologia a Mundi Exordio ad 1568* (Cologne, 1569); *Tabula Geographica ad Mentem Ptolemai restituta* (1578); and *De Creatione ac Fabrica Mundi*, a treatise prefixed to the uniform edition of his maps (1594).

MEROER, the name of counties in 7 of the United States. I. A W. co. of N. J., bordering on the Delaware river, and drained by Assunpink and Stony creeks; area, 260 sq. m.; pop. in 1855, 82,722. The surface is uneven, somewhat elevated toward the N., and the soil fertile. The productions in 1850 were 124,734 bushels of wheat, 468,670 of Indian corn, 376,123 of oats, and 17,798 lbs. of wool. There were 14 grist mills, 20 saw mills, 3 iron foundries, 6 woollen factories, 3 cotton factories, 4 tanneries, 38 churches, 1 college, and 8,586 pupils attending public schools. It is traversed by the New

Jersey and the Camden and Amboy railroads, and the Delaware and Raritan canal. Capital, Trenton. II. A W. co. of Penn., bordering on Ohio, drained by the Shenango and several smaller creeks; area, 624 sq. m.; pop. in 1850, 33,172. The surface is undulating and the soil fertile; extensive coal mines are found, as also iron and limestone. The productions in 1850 were 206,729 bushels of wheat, 268,710 of Indian corn, 385,976 of oats, and 213,359 lbs. of wool. There were 28 grist mills, 24 saw mills, 5 iron foundries, 2 woollen factories, 12 tanneries, 61 churches, and 8,615 pupils attending public schools. The Beaver and Erie canal intersects the county. Capital, Mercer. III. A S. W. co. of Va., bounded E. by the Kanawha, intersected by Blue Stone river, and drained by various creeks; area, 540 sq. m.; pop. in 1850, 4,222, of whom 177 were slaves. A range of the Alleghanies extends along the N. W. border. The productions in 1850 were 12,284 bushels of wheat, 105,946 of Indian corn, 35,280 of oats, and 12,949 lbs. of wool. Value of real estate in 1856, \$632,580, being an increase of 54 per cent. since 1850. Capital, Princeton. IV. A central co. of Ky., bounded N. E. by the Kentucky river, E. by Dick's river, and drained by the head waters of Salt river; area, 240 sq. m.; pop. in 1850, 14,067, of whom 8,260 were slaves. Its surface is undulating and soil fertile. The productions in 1850 were 1,098,395 bushels of Indian corn, 143,990 of oats, 12,420 lbs. of tobacco, and 47,850 of wool. There were 50 grist mills, 15 saw mills, 8 cotton factories, 5 tanneries, 23 churches, 1 college, and 1,523 pupils attending public schools. Capital, Harrodsburg. V. A W. co. of Ohio, bordering on Ind., drained by the St. Mary's and Wabash rivers and branches; area, 576 sq. m.; pop. in 1850, 7,712. It has a level surface, heavily timbered, and a fertile soil. The productions in 1850 were 51,661 bushels of wheat, 149,506 of Indian corn, 34,918 of oats, and 11,656 lbs. of wool. There were 2 grist mills, 4 saw mills, 1 tannery, 11 churches, and 1,385 pupils attending public schools. Capital, Celina. VI. A N. W. co. of Ill., on the Mississippi river, and bordering on Iowa, drained by Edward's and Pope's creeks; area, 550 sq. m.; pop. in 1855, 9,660. There are extensive prairies in the county, and it is heavily timbered along the banks of the Mississippi; the soil is fertile. The productions in 1850 were 103,479 bushels of wheat, 480,991 of Indian corn, 60,159 of oats, and 19,493 lbs. of wool. There were 3 grist mills, 11 saw mills, 8 churches, and 196 pupils attending public schools. Capital, Keithsburg. VII. A N. co. of Mo., bordering on Iowa, drained by Weldon river and several creeks; area, 530 sq. m.; pop. in 1856, 5,603, of whom 28 were slaves. It has an undulating surface and fertile soil. The productions in 1850 were 7,311 bushels of wheat, 149,555 of Indian corn, 26,500 of oats, and 8,575 lbs. of wool. Capital, Princeton.

MEROER, HUGH, an American revolutionary general, born in Scotland about 1720, died near

Princeton, N. J., Jan. 12, 1777. He was educated as a physician, and served as a surgeon's assistant in the army of the young pretender at the battle of Culloden. Emigrating soon after to America, he settled in Virginia, and resided there in the practice of his profession until 1755, when he volunteered in the expedition led by Braddock to Fort Duquesne. At the disastrous battle of Monongahela, July 9, he was severely wounded in the shoulder, and, unable to keep up with the fugitives, wandered alone through the wilderness to Fort Cumberland, 100 m. distant, where he arrived almost exhausted by sickness, famine, and fatigue. He subsequently returned to his practice, but at the outbreak of the revolution promptly joined the continental army, and through the influence of Washington obtained the rank of brigadier-general with the command of the flying camp organized in the spring of 1776. He subsequently accompanied Washington on his retreat through New Jersey, and rendered valuable assistance at the battle of Trenton. In the succeeding action at Princeton he led the vanguard, composed principally of militia. His men beginning to waver before the attack of the enemy, he made an energetic attempt to rally them, and was felled to the ground by a blow from the butt end of a musket. Though surrounded by British soldiers, he rose and defended himself with his sword, refusing quarter, and after a brief struggle, in which he was repeatedly bayoneted, was left for dead upon the field. He was removed soon after the battle to the house of a Mr. Clark in the neighborhood, where a week afterward he died in the arms of Major Lewis, Washington's nephew and one of his aids. His corpse was followed to the grave in Philadelphia by upward of 80,000 people. In Nov. 1840, a monument to his memory was dedicated at the Laurel Hill cemetery.

MERCER, JESSE, an American clergyman, born in Halifax co., N. C., Dec. 16, 1769, died in Butts co., Ga., Sept. 6, 1841. He was ordained to the Baptist ministry in his 20th year, and took charge of a church in Wilkes co., Ga. In 1798 he was a member of the convention to amend the constitution of the state of Georgia, in which body his services proved highly valuable. At this convention it was proposed by a member of the legal profession that ministers of the gospel be declared ineligible to seats in the state legislature. Mr. Mercer moved, as an amendment, that both lawyers and doctors be included in the provision, which caused the original mover to withdraw his motion. He was at one time a candidate for state senator from Wilkes co., but was defeated. He was also solicited to offer himself for governor, but refused. He was an eloquent preacher, and had much influence with his denomination. "Mercer's Cluster," a volume of hymns compiled by him, is still in use with various Baptist congregations. Mercer university, in Penfield, Ga., to which he left most of his estate, was named in his honor.

MERCERSBURG, a post borough of Franklin co., Penn., 15 m. S. W. from Chambersburg, and 62 m. S. W. from Harrisburg; pop. in 1850, 1,184. It is the seat of Marshall college, which was founded in 1836, under the direction of the German Reformed church, and has 6 professors and 165 students, and a library of 3,000 volumes. A theological seminary, with a library of 6,000 volumes, and a law department, are attached to the college.

MERCHANT, COMMISSION. See FACTOR.

MERCIA, the largest kingdom of the Saxon heptarchy in the island of Britain. It was situated inland, being bounded N. by Northumbria, E. by East Anglia and Essex, S. by Wessex, and W. by Wales, and included the modern counties of Chester, Derby, Nottingham, Lincoln, Salop, Stafford, Leicester, Rutland, Northampton, Huntingdon, Hereford, Worcester, Warwick, Gloucester, Oxford, and Buckingham, and parts of Hertford and Bedford. It was founded by Orida, an Angle, in 585, was afterward subject for a time to the Northumbrians, and after overcoming East Anglia and Kent, was finally conquered by Egbert, king of Wessex, in 825.

MEROK, JOHANN HEINRICH, a German scholar, born in Darmstadt, April 11, 1741, died by his own hand, June 27, 1791. He officiated in various public functions in his native town, translated Addison's "Cato" and other works from the English, coöperated with Lavater in the publication of his work on physiognomy, and took an active part in the *Frankfurter gelehrten Anzeigen*, *Deutscher Merkur*, and other leading periodicals, and in various other literary enterprises. His select works were edited long after his death by Stahr, and published in Oldenburg in 1840. He is chiefly remembered, however, in German literature on account of his intimate association with Goethe, Herder, and other eminent men, upon whose intellectual development he exerted a great influence by the boldness of his literary criticism. The latter part of Merck's life was saddened by domestic and pecuniary misfortunes which led him to shoot himself. The letters addressed to him by Goethe, Herder, Wieland, &c., were published in 1835; and another edition of his correspondence, including both letters received and written by him, appeared in 1838.

MERCURY, or QUICKSILVER, a metal of the color and lustre of silver, and fluid at ordinary temperatures, whence its ancient name of *argentum vivum*, and that by which it was called by Aristotle and Theophrastus, who made the earliest mention of it, *αργυρος χυρος*, fluid silver. It was also known as *hydrargyrum*, and from this its chemical symbol, Hg, is derived. The equivalent of the metal is 100; and its specific gravity, which varies somewhat with the temperature, is given by Kopp as 13.557 at 62.6° F. At 39° or 40° below zero the metal becomes solid and crystallizes in regular octahedrons, contracting in bulk and assuming the density of 14; the mass is malleable, and resembles lead. Its boiling point is 662°, at which it forms an

invisible, transparent vapor, the density of which is 6,976, air being 1,000. Before assuming this form, if exposed to the air at high temperatures, it absorbs oxygen and is converted into the red oxide, which is decomposed at the boiling point. Above 40° mercury is somewhat volatile, as may be shown by holding an iodized daguerreotype plate, that has been submitted to the action of light in the camera, over a bath of mercury, when the picture will be brought out by the vapor. Gold leaf is also affected by the vapor when suspended in a vial containing mercury and kept at ordinary temperatures. Strong nitric acid dissolves mercury; but hydrochloric acid, hot or cold, does not affect it. It is oxidized by heated concentrated sulphuric acid. Exposed for a long time to the air, mercury gathers a film of oxide of gray color upon its surface, which adheres to the glass in which the metal is contained. When mercury contains dissolved in it lead, zinc, or other extraneous oxidizable metals, these may be removed by covering the surface of the metal, placed in a shallow vessel, with dilute nitric acid, and stirring frequently. The acid attacks and takes up the foreign matters, and may also form a crust of nitrate with a small portion of the mercury. This is a more efficient method of purification than that of distillation when zinc is present, as this is distilled over with the mercury. Impurities mechanically mixed with mercury may often be removed by straining the metal through paper perforated with a very small hole, or squeezing it through wash leather. But if a film of oxide still adheres to the mercury, this may be removed by agitating it violently in a bottle in which some powdered white sugar has been introduced, then blowing air into the bottle, repeating the shaking and blowing several times, and then filtering. Mercury has the property of uniting with various metals, as gold, silver, tin, lead, zinc, and bismuth, and forming compounds, which are noticed under the head of AMALGAM. In some cases the cheapest of the metals named have been used to adulterate mercury. The effect of this mixture is to produce an amalgam, the presence of which is easily detected by the fluid, when poured upon a plate of glass or porcelain, not flowing freely, but leaving a trace behind it.—Mercury occurs native, and also as an amalgam combined with silver; but these are comparatively unimportant as sources of its supply. The native metal is met with in globules scattered through the masses of rock that contain the veins of its ore, and also in the gangue of these. Sometimes it collects in the cavities in quantities sufficient to be gathered up. In the alluvial deposits near Huancavelica in Peru, it has been found to the amount of 600 lbs. in digging a ditch not over 8 feet in depth. But the chief source of the metal is its ore, the sulphuret, of which an account has been given under CINNABAR. Its veins and beds are found in geological formations of almost all ages, and particularly in talcose and argillaceous slates,

and in the shales of the silurian period. The coal measures and the old red sardstone also contain them. The ore is more or less mixed with the wall rocks of the veins, and the stuff is often worked to profit when its percentage of metal amounts to 3.8 lbs. per ton. When separated from these by roasting in suitable furnaces, the metallic vapors are condensed and the mercury is transferred into bottles of wrought iron, or into leather bags. The bottles, called flasks, imported into the United States from the Spanish ports, and principally from Cadiz, contain 76½ lbs. of mercury. The Austrian product is shipped from Trieste in bags formed of whole skins of white leather, which contain 81 lbs. each, and are packed 4 together, with straw, in a rough sort of flat keg.—The Spanish mines of Almaden in the province of La Mancha are the most important mines of mercury in the world, and were worked by the ancient Romans, who according to Pliny annually obtained from them in his time about 700,000 lbs. of cinnabar. The veins, chiefly of cinnabar, are found at the junction of the metamorphic rocks with silurian slates and sandstones, and are traced in an E. and W. direction between Chillon and Almadenejos, a distance of about 12½ miles. They are very conspicuous in the bare rock which forms the summit of the hill, in which the mines are worked. Two of the principal veins, one of 2 and the other of 14 feet width, are seen to meet in this hill, and at their junction expand into a bed nearly 100 feet wide, constituting the prodigious mass of ore called *el Rosario*. In consequence of this immense development, it has not been found necessary to extend the workings below 1,000 feet, notwithstanding the long time the mining operations have been going on. The Spanish government holds the title to the mines, and derives a large revenue from their product. They have long been leased to the Rothschilds and other bankers of Europe; and so large a portion of the whole product of the quicksilver of the world has been derived from them, that the price of this article has depended upon the bargain made with the government by the contractors. The opening of the California mines has, however, of late years rendered the market much more independent. Their annual product has been in the present century from 2,700,000 lbs. to 3,456,000 lbs., and this from ores the average yield of which is only about 10 per cent.—The other mines of mercury in Europe, next in importance to those of Almaden, are the Austrian mines at Idria, in Carniola. (See IDRIA.) Cinnabar is here interspersed together with some native mercury through shales and a black compact limestone of the age of the Jura limestone. These mines are controlled by the government, and their annual product, which from 1843 to 1847 averaged 858,281 lbs. per annum, was formerly larger, and has since amounted to 648,000 to 1,080,000 lbs. The greatest depth is 840 feet, and the descent is by 757 steps out in the rock. The ore is excavated with the

pick, and in some portions of the mine the soft earthy material contains visible globules of native mercury distributed in stratiform arrangement. These sometimes occur in quantities sufficient to roll out upon the floor of the workings. Where the mine is most productive in native metal, the atmosphere is so contaminated with mercurial fumes that the miners continue working only 4 hours at a time, and, as at other mines of this character, many are always suffering from the effects of the mercury.—Other countries in Europe which contain workable mines of mercury are Hungary and Transylvania, the annual product of which has been rated at 75,000 to 97,200 lbs.; Deux Ponts, 43,300 to 54,000 lbs.; and the rest of the Palatinate, 19,440 to 21,600 lbs. The mines of these localities are in sandstones belonging to the upper part of the coal formation. They contain impressions of plants and of fishes, and the scales of the latter are sometimes converted into cinnabar, the organic matter having been a centre for collecting the mercurial deposit. The metal is met with in other parts of Europe, but not in important quantities. At Ripa, in Tuscany, cinnabar forms very small veins in mica slate. In France native mercury is found at Montpellier, disseminated through the tertiary marls and calcareous conglomerates upon which the city is built.—Upon the American continent, mines of mercury have long been worked in the Andes. In Chili the ores are found in granitic rocks, and in Peru in the sandstones associated with the coal. The mines of Huancavelica in the latter country are of great extent, and were worked as far back as the year 1566. The ores are disseminated through a body of sandstones and shales which slope together toward the W. at an angle of about 64°. No evidence of a vein is seen, but the appearance is as if the ores had been introduced in the form of vapors. The thickness of the productive belt is about 850 feet, and along this are open excavations extending a third of a mile in length, and laid out without plan in the most injudicious and dangerous method. It has often happened that portions have caved in, and at one time 200 workmen were destroyed by such an accident. From 1570 to 1789 the product of the mine, as given by Humboldt, was 1,040,469 quintals of mercury, worth, at \$78 per quintal (the price paid by the government), \$75,954,257. The quintal of Peru and Mexico is 101.61 lbs. avoirdupois. From 1790 to 1845 the product was about 66,000 quintals. The other mines of Peru are supposed to yield about as much as those of Huancavelica, and the total annual product is but little if any more than 200,000 lbs. Mercury is found at many localities in Mexico; but notwithstanding the immense consumption of the metal, amounting, it is stated, to 16,000 quintals annually, in the processes of amalgamating the silver ores, no mines of it are now worked. About the year 1844 some 400 to 500 quintals were obtained from mines near Guadalajara. Humboldt describes its occurrence at many points, and its as-

sociation at Durango with porphyry upon which the cinnabar ore rests, while it is covered with shaly clay containing fossil wood and coal. At San Juan de la Oñiza the cinnabar veins are in a pitchstone porphyry; and at the time of Humboldt's visit they had been worked to the depth of 150 feet. Upon the price of mercury depends in no small degree the successful working of many of the silver mines of Mexico. The supplies were formerly furnished by the Spanish government exclusively; and of late years the Mexicans have paid for mercury in their harbors \$120 per quintal, making it about \$165 in the mining region of Zacatecas.—In California a mine of cinnabar was opened and first worked for mercury in 1845 by Capt. Andreas Castillero. For a long time the Indians, it was found, had used this material as a paint, and had made excavations in search of it for some 50 or 60 feet into the mountain; and the Spaniards also in 1824 and afterward had made attempts to work the same ores for silver. In 1846, in consequence of the disordered state of the country, the mine was not worked. After the war, in 1848, operations were recommenced, and in 1850 a company of Mexicans and English worked the mine and continued in possession till Sept. 1858, when they were enjoined by the U. S. court from continuing their operations until the title to the property should be determined. The product up to this time had amounted, according to the legal papers presented, to over \$8,000,000, and was estimated annually at about \$1,000,000. The locality, now called New Almaden, is in one of the branch valleys of the San José, Santa Clara co., 12 m. from the town of that name, which is itself 54 m. from San Francisco. The ore is found irregularly disseminated among beds of argillaceous shales and flinty strata, supposed to belong to the Silurian group, in a range of E. and W. secondary hills along which it is traced 8 to 4 m. These beds dip at a high angle and are greatly contorted. Veins of carbonate of lime traverse the rocks and the layers of ore, and displace the small veins. Few foreign minerals are associated with the cinnabar; these are pyritous iron and copper and arsenical pyrites. Rich masses of the ore yield 67.25 per cent. of mercury, 10.33 per cent. of sulphur, and 22.55 per cent. of silica, alumina, &c. The average yield of the ore is about 80 per cent. The mine is entered by a large cross-cut adit, 200 feet below the older workings, and extending 1,200 feet into the hill. Side galleries are excavated on the line of the ore deposits, following these in one instance more than 400 feet. The ore brought out and assorted is sent to the smelting works, 1½ m. down the mountain. The finer fragments are worked up with the soft loamy portion, and with water the mass is kneaded and moulded into the form of bricks. These, being dried in the sun, are worked like the rest. The furnaces for reducing the ore were 18 in number in 1854. They were 40 feet long, 8 wide, and 10 high, in rows 6 feet apart. Each furnace was divided into

compartments, the fire occupying one at the end, and the heat passing through the ores in flues. The charge for each furnace was 15,000 lbs. The working portion of the furnace connects by a flue passing upward with the first condensation chamber, the dimensions of which are 8 feet in length, 4 in breadth, and 5 in height. The chambers are covered with cast iron plates luted down. Seven other condensation chambers succeed the first, through all of which in succession the vapors pass before the uncondensable portions are conducted into a tank, where they are sprinkled by a current of water, and thence escape by a wooden chimney. From each chamber the mercury as it condenses is conveyed to an iron vessel, from which it is transferred into iron flasks, the capacity of which is 75 lbs. weight. A charge is worked off in 60 hours, and wood is used for fuel. The mercurial vapors penetrate the mason work of the chambers, and collect in the soot of the chimney and in a fine black deposit upon the roofs around. Men and animals employed about the smelting works are subject to be salivated and otherwise injuriously affected by the mercury; but no ill effects of this kind are experienced at the mines. The total value of the New Almaden property was rated by the U. S. attorney-general in a recent communication to congress at \$15,000,000. The working of the New Almaden mine being stopped, parties were led to look for other sources of mercury along the range of the ore. These were found in Dec. 1858, $\frac{1}{4}$ of a mile west from the old workings. The new locality was named the Enriquita mine, and was worked by Henry Laurencel of California for himself and others. In June, 1860, it came into possession of the "California Quicksilver Mining Association," by which it is now vigorously worked. The production has been as follows: Sept. 1859, 14,400 lbs.; Oct., 28,650; Nov., 27,525; Dec., 28,425; Jan. 1860, 27,000; Feb., 16,950; March, 25,500; April, 33,700; May, 46,275; June, 48,750; July, about 60,000. The ore on hand for August was sufficient to produce about 80,000 lbs. The total expenditure for exploration and machinery at this mine has been about \$175,000, nearly all of which is already paid for from the products. Connected with the Enriquita and owned by the same company is another mine called the Providencia, from which very rich ores have been obtained in moderate quantities. Another mine on the same range, at its extreme western portion, is worked by the Santa Clara mining company of Baltimore. It is called the Guadalupe mine, and is producing from 10,000 to 15,000 lbs. of quicksilver per month. The custom house returns previous to the opening of these mines present the following as the production of the New Almaden mine for the years named: 1853, 18,800 flasks; 1854, 20,968; 1855, 27,165; 1856, 28,740; 1857, 27,262; 1858 ($\frac{1}{4}$ of the year), 24,182; total, 143,062 flasks of 75 lbs. each, or 10,854,650 lbs. Add for California consumption 85,516 flasks, and

the grand total is 177,578 flasks, or 13,818,850 lbs.—The total production of mercury throughout the world, according to the estimates of Dumas as given above, may be thus summed up:

| | Lbs. avoirdupois. | |
|-------------------------------|-------------------|--------------|
| Almaden, Spain..... | 2,700,000 | to 3,458,000 |
| Idria..... | 648,000 | " 1,080,000 |
| Hungary and Transylvania..... | 75,600 | " 97,200 |
| Deux Ponts..... | 48,200 | " 54,000 |
| Palatine..... | 19,400 | " 21,600 |
| Huancavelica..... | ..... | " 294,000 |
| California..... | ..... | " 2,000,000 |
| Total..... | 7,082,500 | |

—Metallic mercury in its usual form has no action upon the human system; it has been taken with impunity in quantities of a pound weight; but in vapors it acts energetically upon those exposed to their influence, producing nervous tremblings, shaking palsy, salivation, vertigo, and other disorders of the brain. When the metal has been long triturated or violently shaken in a bottle, its particles are thereby minutely divided, and they take the form of a gray powder in which the metallic appearance is lost. The particles still retain the globular form, as is proved by microscopical examination, and according to Ehrenberg they are only from $\frac{1}{16}$ to $\frac{1}{1000}$ of a line in diameter. In this condition the mercury acts as a powerful medicine, probably from its readiness in its finely divided state to enter into new combinations.—Mercury with chalk, or *hydrargyrum cum creta*, prepared by rubbing up 3 ounces of mercury with 5 ounces of prepared chalk, and blue pill made from a mass composed of one ounce of mercury rubbed up with one and a half ounce of confection of roses, and then beaten with half an ounce of powdered liquorice root, are preparations in very frequent use. When blue pill is taken in small but repeated doses, the first appreciable effect is usually an increased activity of the secretions, particularly of the intestinal canal, the discharges from which become liquid and bilious; the mucous membrane of the lungs and genito-urinary apparatus may display a similarly augmented secretion. If there happen to be anywhere an interstitial deposit of fibrine, or an exudation of lymph, or effusion of serum, its absorption may now be promoted; although Stille says if the mercurial influence be carried too far, extensive ulcers will appear, sometimes coated with false membranes or exudations, and the eyelids and ankles may become cedematous, and even general dropsy may ensue, thus producing what might very properly be called a homœopathic effect. In the next grade of unfavorable action of mercury the appetite fails, digestion is impaired, the secretions become still thinner and more copious, the firmness of the tissues diminishes, newly formed callus is dissolved, and recently healed wounds open afresh; the muscles waste, the skin has an earthy paleness, with the other consequences mentioned above. These symptoms, says Stille, appear to depend upon the radical change which the blood has undergone by losing a large proportion of its natural solid constituents, and perhaps a

portion of that vitality on which its coagulability in part depends; so that an unwonted fluidity and thinness of the blood ensues. The occurrence of salivation is too well known to need description. The power of mercury to increase the discharge of bile cannot well be questioned; as in the case of other stimulants it sometimes exceeds due limits, and may even cause, says Stille, the affection which it generally and with most certainty cures. Thus the celebrated Chapman regarded it as probable that the inordinate use of mercury may, in various ways, derange the stomach, bowels, and liver, so as to produce jaundice; and Cheyne states in as many words that mercurials actually produce jaundice; while Stille says enlargement of the liver is a more usual effect of mercury. On the nervous system the action of mercurials is decided. Stille says: "Few medicines produce such a marked sense of depression both mental and bodily as mercury even in ordinary doses; but when the system is brought thoroughly under its influence, these effects become distressing; the susceptibility to external impressions, and particularly to that of cold, is augmented, pains in the limbs are felt, slight annoyances disturb the equanimity, and sometimes mental debility ensues, so that a moody melancholy and fear of death may overtake the patient." Mercurial fever is a common effect of mercury. Beside the tendency of ulcers on any part of the body to assume an unhealthy appearance under the influence of mercury, it may develop ulcers in the mouth, on the gums, the inner surface of the lips and cheeks, and the tongue; so that many able physicians have even taken the ground that the remoter or secondary and tertiary forms of syphilis are really produced by mercury. The celebrated Bretonneau, by experiments upon animals, discovered that by an excessive use of mercury it is possible to produce symptoms having a perfect resemblance to those of constitutional syphilis, such as affections of the bones and ulcers of the mucous membranes; and that the mercurial disease attacks all those parts which are the seat of syphilis, and nearly in the same order, and assumes nearly the same external appearance.—In the arts, mercury is employed in the construction of philosophical instruments, and is preferred to other fluids for filling thermometers and barometers by reason of the great range of temperature through which it expands or contracts uniformly with equal increase or decrease of heat. Its amalgam with tin is largely used for coating or "silvering" the backs of mirrors. The paint, vermilion, is its sulphuret, cinnabar. But its principal consumption is in the extraction of silver and gold from their ores in the amalgamating process. (See AMALGAMATION.) Mercury forms two compounds with oxygen: one the suboxide or black oxide, Hg_2O ; and the other the red oxide, HgO . When prepared by decomposing the nitrate by heat, it has a bright orange color, and is known as the red oxide of mercury. In the state of a

finely levigated powder, or as an ointment, this is applied externally in medicine as a stimulant and caustic. The name red precipitate, or precipitate *per se*, was given to this oxide because of the manner in which it was formerly prepared. Mercury in a matrass (a glass vessel with a long narrow neck) was subjected continuously to the action of heat. The mercurial vapor rising in the neck of the matrass was converted into red oxide, which was prevented from escaping; and as the operation went on for weeks, the whole was converted into the same compound. Other mercurial compounds of especial interest are the subchloride and chloride, the one described under CALOMEL and the other under CORROSIVE SUBLIMATE.

MERCURY, or HERMES, an ancient deity of the Greeks and Romans. According to the Greek legend, he was a son of Jupiter and Maia, a daughter of Atlas. He was born in a cave of Mt. Cyllene, in Arcadia, whence he is sometimes distinguished by the epithet Cyllenian. Soon after his birth, escaping from his cradle, he went to Pieria, and stole several of Apollo's oxen. His cunning was as precocious as his knavery. Lest the traces of his footsteps should be discovered, he put on sandals, and drove the oxen to Pylos, where he slaughtered two for a banquet and sacrifice, and concealed the rest. On returning to Cyllene, he found a tortoise at the entrance of his cave, of whose shell, and some of the ox intestines brought from Pylos, he constructed the first lyre, on which he immediately performed. Apollo, knowing who had stolen his cattle, came presently to Cyllene to demand restitution; and when Mercury denied the theft he took him before Jupiter, who obliged him to confess. Apollo and the infant god then went to Pylos, where the former received back such of his oxen as had not been slaughtered; but when he heard Mercury perform on the lyre, he was so delighted that he permitted the young musician to retain the cattle, and presented to him his golden *caduceus*, or pastoral staff, teaching him at the same time the art of prophesying with dice. His father Jupiter appointed him herald-general of the gods, in which capacity he was frequently the medium of communication between mortals and immortals. It was he who conducted Priam to Achilles, when the venerable monarch went to beg the body of Hector from his conqueror. He bound the presumptuous Ixion to the wheel for having boasted of intimacy with Juno, chained Prometheus to the Caucasus, and escorted Juno, Venus, and Minerva to Mt. Ida to submit their charms to the judgment of Paris. Mercury was esteemed the author of various inventions indispensable to the weal of human society. The origin of letters, numbers, astronomy, music, military tactics, gymnastics, weights, measures, &c., was ascribed to him. He was also regarded as the god of eloquence, the presiding deity of the gymnasias, and the patron of fraud and perjury. The original seat of his worship was Arcadia, whence it gradually spread over the Grecian world. His festivals were

called *Hermaia*. The most celebrated of his temples was that on Mt. Oyllene in Arcadia. The principal things sacred to him were the palm tree and the tortoise. He is generally represented as a young man with a broad-brimmed hat adorned with wings, in his right hand a herald's staff or a sceptre, and on his feet a pair of winged sandals.—In Rome, Mercury was the god of commerce and diplomacy. The *etyma* of his name, *merz* and *curius*, clearly indicate his predominant function. A temple was raised to him in Rome near the Circus Maximus as early as 495 B. C., and an altar of his stood contiguous to the Porta Capena. Under the cognomen of Malevolus, or the "ill-disposed," he had a statue in the *vicus sobrius*, or sober street, in which no wine shops were allowed to be kept, and there milk was the sole beverage offered to him. This statue held a purse in one of its hands as a symbol of his commercial functions. The festival of Mercury was celebrated on the 25th of May, which was regarded as a high day by the Roman merchants. After the various relations of Greece and Rome had become intimate, the Hermes of the former and the Mercurius of the latter were popularly considered to be identical, though the resemblance between the two divinities was very slight, and was never admitted by the *fetiales*, or guardians of the public faith of Rome.

MERCURY, THE PLANET. See ASTRONOMY.

MERCY, SISTERS OF, OR ORDER OF OUR LADY OF MERCY, a religious order founded in Dublin by Miss Catharine McAuley in 1827. Miss McAuley was born in Dublin, of Catholic parents, Sept. 17, 1778, but being left an orphan in early childhood was bred a Protestant. Soon after reaching years of discretion she resolved to embrace the Roman Catholic faith, and to devote her life and her large fortune to the service of the poor. She induced a number of other ladies to join her, purchased a house in Dublin, and there opened an asylum for destitute young women and a free school for the children of the poor. Soon afterward, in common with her companions, as a preliminary step to the foundation of a new congregation, she underwent a regular noviceship and took the veil in a convent of Presentation nuns. The institute of which Miss McAuley thus became the foundress and first superior was approved by Pope Pius VIII. The rule of St. Augustine was subsequently adopted as the basis of the new order, but with several changes and additions, which received the approval of Pope Gregory XVI. in 1835, and his formal confirmation in 1841. From Dublin the sisters of mercy spread rapidly over Ireland, and extended to England, Scotland, and the British colonies. The first community in the United States was established in Pittsburg in 1843. The order has since been introduced into the dioceses of Baltimore, Cincinnati, Little Rock, New York, Buffalo, Brooklyn, Hartford, Portland, St. Louis, Chicago, San Francisco, and the vicariate apostolic of Florida, and into various parts of South

America. The sisters of mercy have in view, beside other charities, the visitation of the sick and prisoners, the instruction of poor girls, and the protection of virtuous women in distress. Wherever their means permit they found "houses of mercy," where destitute girls of good character are cared for until employment can be found for them. They have also the direction of several orphan asylums and hospitals in the United States. The sisters of mercy are subject to the bishops, and have no general superior, each community being independent of the rest of the order. The sisterhood is divided into two classes, choir sisters and lay sisters. The choir sisters are employed about the ordinary objects of the order, and the lay sisters about the domestic avocations of the convent and such other duties as may be assigned to them. Candidates for membership of either class undergo a preliminary "postulancy" for 6 months; at the end of that time they assume the white veil and become novices. The noviceship lasts two years. The vows, which are taken for life, bind the members to poverty, chastity, obedience, and the service of the poor, sick, and ignorant. The habit of the order is a black robe with long loose sleeves, a white coif, and a white or black veil. In the streets a bonnet of black crape is worn instead of the coif and veil.

MERGANSEER, a name applied to most of the saw-billed ducks, of the sub-family *merginæ*, of which the goosander, the largest species, has been described under that title. The bill is very slender, narrow, compressed, ending in a conspicuous nail, and with the edges serrated; tarsi much compressed, the scales largest anteriorly; and the tail feathers 18 in the North American species. In the genus *mergus* (Linn.) the bill is longer than the head, and mostly red, with the serrations conical, acute, and recurved; the tarsi about $\frac{2}{3}$ of the middle toe; tail about $\frac{1}{2}$ the length of the wings; and head with a depressed crest. The red-breasted merganser (*M. serrator*, Linn.), sometimes called sheldrake in this country, is about 2 feet long, with an extent of wings of 33 inches, the bill $2\frac{1}{2}$ inches, and a weight of $2\frac{1}{2}$ lbs. In the male, the head and upper neck are dark green, the throat reddish brown with black streaks, sides finely barred with transverse black lines, feathers in front of wing white with black margins, white of wing crossed by 2 black bars, and under parts reddish white; head with conspicuous pointed crest; nostrils posterior. In the female, the upper parts are ash-colored, the lower reddish white, compressed crest chestnut brown, black at base of secondaries exposed; outer tertials white, edged with black. This bird is distributed over the whole of North America and Europe, fishing chiefly in fresh water; it breeds in the middle and eastern states, and as far north as Labrador, beginning to build, according to latitude, from the first of March to the middle of May, among the rank grasses near fresh water; the nest is carefully made of dried weeds and mosses, and lined with down from

the breast of the female; the eggs are from 6 to 10, $2\frac{1}{2}$ by $1\frac{1}{4}$ inches, in shape like those of the domestic fowl, and of a uniform pale yellowish cream color; the young betake themselves at once to the water, swimming and diving with great expertness. It is a very shy bird, and difficult to procure; the flight is rapid and well sustained; the habits are gluttonous; the food consists of fish, and its flesh is tough and fishy.—In the genus *lophodytes* (Reich.) the bill is shorter than the head, black, with oblique, low, short serrations, and the point truncated and not recurved nor acute; tail more than half the wings, tarsi half the middle toe, and head with an erect vertical crest. The only species is the hooded merganser (*L. cucullatus*, Reich.), which is about 18 inches long, with an extent of wings of 26 and the bill 2 inches, and a weight of about $1\frac{1}{2}$ lb. In the male, the head, neck, and back are black, with the under parts and centre of crest white; sides chestnut brown, barred with black; 2 black crescents on the white in front of the wing; lesser coverts gray; speculum of wing white, with a basal and median black bar; tertials black, with central white streaks; crest semicircular. In the female, the crest is shorter and more pointed; the head and neck reddish brown; no pure black on the back nor bars on the sides; white on the wings less, and the size much smaller. This, with the exception of the European white merganser (*mergellus albellus*, Selby; see SMEW), is the handsomest of the family. The habits are those of the other mergansers; it is distributed over the whole of North America. The eggs are like those of the preceding species, except that they are smaller; the flesh has a fishy taste and odor.—There is a small merganser in South America, for which was established the genus *mergametia* (Gould), which seems to mark the transition from the ducks to the mergansers. The bill is as long as the head, straight, compressed, elevated at the base; the shoulder of the wing in both sexes is armed with a strong sharp spur; the tail is lengthened, rounded, of rigid and pointed feathers. The only species mentioned by Gray is the *M. armata* (Gould), found inhabiting the rapid rivers of the Andes, swimming and diving against the mountain torrents with the utmost ease; so at home is it on the water, and so rarely disturbed, that it seldom makes use of its wings except for short flights; they are generally seen in pairs.—The affinity of the mergansers with the ducks is further shown by the occurrence of hybrids; there is in the cabinet of the Boston society of natural history a wild hybrid between the *L. cucullatus* and the golden-eyed duck (*clangula americana*).

MERIAN. I. MATTHÄUS, the elder, a Swiss designer and engraver, born in Basel in 1598, died in Schwalbach in 1651. He executed many plates of views in Germany, France, and Switzerland, but is best known by a series representing the environs of Heidelberg, Stuttgart, and other cities, from his own designs, published in Frankfort. Among his pupils was

the well known engraver, Wenzel Hollar. In the latter part of his life he removed to Frankfort-on-the-Main, where he established a book and print business. II. MATTHÄUS, the younger, son of the preceding, born in Basel in 1621, died in Frankfort in 1687. He studied painting under Vandyke and Rubens, and attained a considerable reputation for his portraits, particularly the equestrian ones. Among his best works of this class were the portraits of the emperor Leopold I. and other German princes, painted after the manner of Vandyke, and that of Count Serini on horseback. He also executed some historical pictures of merit, including a "Martyrdom of St. Lawrence" in the cathedral of Bamberg. III. MARIA SIBYLLA, sister of the preceding, born in Frankfort, April 12, 1647, died in Amsterdam, Jan. 18, 1717. She drew from nature flowers, caterpillars, butterflies, and similar objects, which she executed in miniature with wonderful truthfulness. In 1665 she was married to Johann Andreas Graff, with whom she took up her residence in Nuremberg, retaining however her own name. She projected an entomological work, to be illustrated from her own designs, which was published in Dutch in 1679-'83, under the title of "The Origin of Caterpillars, their Nourishment and Changes" (2 vols. 4to., Nuremberg). A Latin translation of it appeared in Amsterdam in 1717, and in 1780 a new edition enlarged by her daughters and herself was published there in French under the title of *Histoire générale des insectes de l'Europe*. In 1684 she settled with her husband in Holland, and in 1699 made a voyage to Surinam, where during a residence of 2 years she prepared the materials for her *Dissertatio de Generatione et Metamorphosis Insectorum Surinamensium* (Amsterdam, 1705), of which a new edition with additional plates was published soon after her death under the supervision of her daughters. Her two works were republished together in 1768-'71 under the title of *Histoire des insectes de l'Europe et de l'Amérique* (fol., Paris).

MERIDA, the capital of Yucatan, in lat. $20^{\circ} 50'$ N. and long. $89^{\circ} 40'$ W.; pop. about 40,000, chiefly Indians and half breeds. It is built on an arid plain, on the site of a native city, about 25 feet above the sea level, and 25 m. from the gulf of Mexico. It is an ancient-looking place, and has wide and regular streets meeting in a large square in the centre, where the bishop's palace and the government house are situated. There is a cathedral, 14 churches, and the ruins of the monastery of San Francisco, which occupy about 5 acres of ground, and are enclosed by walls 40 feet high and 8 feet thick. The legislature meets in a convent once belonging to the Jesuits, most of which is in a ruinous condition. The college of Merida has a president and two or three professors, but its range of studies is very limited. Merida has a considerable trade, and there is an excellent road to the port of Sisal on the N. W. side of the peninsula. The climate, though dry and not

liable to sudden changes, is not very healthy. The town was founded by the Spaniards in 1542.

MERIDEN, a township and village of New Haven co., Conn., on the New Haven, Hartford, and Springfield railroad, 18 m. N. E. from New Haven; pop. of the township in 1860, 7,800. The village is handsomely situated on an elevation about $\frac{1}{2}$ m. from the railroad, and contains a bank, an academy, and several extensive manufactories. West Meriden, $\frac{1}{2}$ m. W., on the railroad and on the Quinepiack river, contains the state reform school, a high school, a newspaper office, and several manufactories and shops. In 1860 there were in the township 8 churches (1 Baptist, 3 Congregational, 1 Episcopal, 1 Methodist, 1 Roman Catholic, and 1 Universalist). Among the leading manufactures are tin and britannia ware, ivory combs, table cutlery, hardware, and machinery.

MERIDIAN. See **LONGITUDE**.

MÉRIMÉE, PROSPER, a French author, born in Paris, Sept. 28, 1803. He is the son of a painter, studied law, and was received as advocate, but did not practise his profession. After the revolution of 1830 he became secretary of the count d'Argout, and successively officiated as secretary in the ministries of commerce and marine. Subsequently he succeeded M. Vitet as inspector of ancient historical monuments of France, which furnished him with the materials for a number of valuable archaeological works. In 1844 he was elected to the French academy, as successor of Charles Nodier. A paper written on behalf of his friend Libri, who had been accused of purloining from public libraries, subjected him to a brief imprisonment. While in Spain he became acquainted with the family of the present empress of France, and in 1858 he was made a senator. He has contributed to the romantic literature and drama of France the *Théâtre de Clara Gansul, comédienne Espagnole* (1825; new ed. 1846), a professed translation from the Spanish, and *La Guzla* (1827), a professed collection of Illyrian songs, both of which were original productions. His reputation has since been ably sustained by a series of novels, as *La double méprise*, *Colomba*, *Carmen*, &c. He has also written valuable historical novels, as *La Jacquerie*, &c., and a number of historical works. Among the latter are his *Histoire de Don Pèdre I., roi de Castille* (Paris, 1848; German translation, Leipzig, 1852), and *Épisode de l'histoire de Russie: les faux Démétrius* (1854). His *Mélanges historiques et littéraires* and his *Marino Vreto, contes et poèmes de la Grèce moderne*, both appeared in 1855.

MERINO, GERONIMO, better known as "the priest Merino," a Spanish guerilla leader, born in Villaobiado, Old Castile, about 1770, died in 1847. He was educated at the theological college of Lerma, and, after spending 4 years in agricultural labor on the farm of his parents, he officiated in the parish church of his native village until 1808, when he came forward as the leader of a guerilla band against the French, displaying much courage and ferocity. In 1811

he avenged the execution of 4 members of the provincial junta of Burgos by putting to death 110 French prisoners. His cruelty caused him to be shunned even by his own relatives, but his fanatical allegiance to the cause of Don Carlos brought him into favor with that prince, and in Nov. 1838, he stood at the head of 20,000 volunteers between Burgos and Aranda when Gen. Quesada compelled him to take to flight. However, he continued to wage a guerilla war against the opponents of Don Carlos until 1838, when he was hopelessly defeated. He afterward accompanied the pretender to France, where he died.—Another Spanish priest, named MARTINO MERINO, a fanatical liberal, made an attempt upon Queen Isabel's life, on her return from the church, Feb. 2, 1852, inflicting a slight wound upon her, and was garroted 5 days afterward.

MERINO SHEEP. See **SHEEP**.

MERINTHUS. See **CERINTHUS**.

MERIONETHSHIRE, a maritime county of N. Wales, bordering on Cardigan bay; area, 602 sq. m.; pop. in 1851, 38,848. The surface is almost entirely rocky and mountainous, several of its summits attaining a height of 2,500 or 3,000 feet above the level of the sea. The most celebrated elevation is Cader Idris, whose summit is crowned with immense columns of crystalline basalt, similar to those forming the Giant's Causeway in Ireland. The principal rivers are the Dee, Maw, and Dovy. The most considerable lake is Bala, which is 12 m. in circumference. The minerals are gold, silver, lead, copper, limestone, and slate. At the slate quarries of Festiniog 3,000 persons obtain constant employment. Agriculture is generally in a backward state. The county returns one member to parliament. Capitals, Dolgelly and Bala.

MERIVALE. I. JOHN HERMAN, an English author, born in Exeter in 1779, died in April, 1844. He studied at St. John's college, Cambridge, but took no degree, on account of his being a Presbyterian, although afterward he joined the established church. He was called to the bar in 1805, practised for several years in the court of chancery, and officiated as commissioner of bankruptcy from 1831 till his death. He published several volumes of chancery reports, and contributed to the Rev. Robert Bland's "Collections from the Greek Anthology," of which he prepared a 2d edition in 1838. He published a poem, "Orlando in Roncesvalles," most of which is a free and abridged version of the *Morgante Maggiore*. A collection of his "Poems, Original and Translated," comprising the greater part of his earlier pieces, appeared in 1841, and was followed shortly before his death by translations of the "Minor Poems of Schiller." II. HERMAN, son of the preceding, published in 1841 "Lectures on Colonization and Colonies." III. Rev. CHARLES, B.D., is known as a historical writer by his great work still in progress, entitled "The Romans under the Emperors" (vols. i. to vi., 1850-'59), an abridgment of the first part of which was

published under the name of the "Fall of the Roman Republic" (1853).

MERIWETHER, a W. co. of Ga., bordered on the E. by the Flint river, and drained by a number of creeks; area, 525 sq. m.; pop. in 1859, 15,023, of whom 8,377 were slaves. There are a number of medicinal springs, for which the county is noted. The Warm Springs discharge 1,400 gallons per minute at a temperature of 90°. The productions in 1850 were 594,601 bushels of Indian corn, 116,791 of sweet potatoes, 98,050 of oats, 8,934 lbs. of rice, and 12,862 bales of cotton. There were 9 grist mills, 5 saw mills, 3 tanneries, 21 churches, and 360 pupils attending public schools. Capital, Greenville.

MERIWETHER, DAVID, an American soldier, born in Virginia in 1755, died near Athens, Ga., at an advanced age. During the revolution he became a lieutenant in the continental army, and did active service in New Jersey and elsewhere. He was present at the siege of Savannah, and was there taken prisoner, but was subsequently released on parole. In 1785 he removed to Georgia, and settled in Wilkes co., which he several times represented in the state legislature. In 1800 he was elected a representative to congress, and was a witness and participant in the struggle between Jefferson and Burr, being a warm supporter of the former. Associated with Gen. Jackson and Gov. McMinn of Tennessee, he concluded a treaty with the Cherokees, by which a large territory W. of the Appalachian river was ceded to the United States for the use of Georgia. He also made treaties with the Creeks and other tribes of Indians.

MERLE D'AUBIGNÉ. See AUBIGNÉ.

MERLIN, a European falcon, of the genus *hypotriorchis* (Boie), which differs from the genus *falco* (Linn.) chiefly in the more lengthened and slender tarsi, and long slender toes. This bird (*H. asalon*, Gmel.) is about a foot long, with an extent of wings of 29 inches, the male being a little smaller; it is the smallest of the British falcons, of pleasing colors, compact and graceful in form, with large head and short strong bill, the closed wings about 1½ inches shorter than the tail. In the male, the upper parts are deep grayish blue, each feather with a black central line, the tail barred with black, and the lower parts light reddish yellow with oblong blackish brown spots; in the female, the upper parts are grayish brown with darker shafts, the tail barred with pale reddish, and the lower parts yellowish white with large longitudinal markings; in both sexes the bill is pale blue at the base, and bluish black toward the end. From its courage and docility it was formerly trained to pursue larks and the smaller game birds. It is found all over Europe and western Asia; it very much resembles the American pigeon hawk (*H. columbarius*, Boie).

MERLIN, the name of two ancient British seers and sorcerers, who lived in the 5th and 6th centuries A. D. I. MERLIN AMBROSIVS, a native of Wales, is represented to have been the

son of a demon by a Cambrian princess. When a mere youth he recommended himself to the notice of King Vortigern by the display of supernatural powers; and he subsequently became the counsellor of that monarch, and of his successors Ambrosius, Uterpendragon, and Arthur. This is the Merlin to whom allusion is made by Spenser in his "Faery Queen," and by other old poets. He is also the subject of the metrical romance entitled "Merlin," of which Mr. Ellis has given an analysis in his "Early English Romances." A book of prophecies attributed to him was printed in French in 1498, in English in 1529, and in Latin in 1554. The principal account of him is given by Geoffrey of Monmouth, in his *Historia Britonum*. "The Life of Merlin Ambrosius, his Prophecies and Predictions interpreted, and their Truth made good by our English Annals," by T. Heywood, appeared in London in 1641. II. MERLIN CALEDONIUS SYLVESTRIS, or THE WILD, was a native of Strathclyde, in the S. W. of Scotland. He was contemporary with St. Kentigern, bishop of Glasgow, in the latter part of the 6th century. According to Fordun, having slain his nephew, he fled to the woods, and there led the life of a savage till his death. A band of peasants pursuing him, he sprang from a rock into the Tweed, in order to escape them, and was impaled on a stake that chanced to be in the bed of the river. The grave of this Merlin is still pointed out at Drummelzier, a village in Peeblesshire. A metrical life of him, incorrectly ascribed to Geoffrey of Monmouth, was printed for the Roxburgh club (London, 1880). The works attributed to him were published at Edinburgh in 1615; but as the rhapsodies and prophecies of the Cambrian and Caledonian Merlins are commonly confounded, being sometimes ascribed to one and sometimes to the other, it is now almost impossible to distinguish between them.

MERMAN AND MERMAID, fabulous beings dwelling in the sea, having the head and body of a man or woman, and the tail of a fish. The fiction may be derived from that of the tritons and nereids or sea nymphs of antiquity. Pliny, *Ælian*, and Pausanias give particular accounts of their being seen by sailors and others, especially in the seas around the island of Taprobana, and on the neighboring coast. Julius Cæsar Scaliger, in his commentary on Aristotle (*De Animalibus*), maintains their existence. According to Alexander ab Alexandro, Theodore Gaza once saw a mermaid cast on shore in the Morea after a heavy storm. It had a human and charming countenance, but a scaly body and tail, was terrified and burst into tears on finding itself surrounded by spectators, and at the first opportunity scrambled back to the sea, plunged joyously in, and disappeared. In Alexander's own time the appearance of a merman in Epirus was a matter of public record. Rondelet (1554) gave a picture of a singular merman seen in Poland, which was clothed by nature with the garb of a bishop. The most formidable animal of this kind is the devil-merman, *monstrum*

marinum demoniforme, captured on the shore of Illyria, seen alive at Antwerp, and described by Aldrovandus. In the reign of Roger, king of Sicily, a young man bathing on shore met a maiden of great beauty, who remained for a time with him, but never spoke, and finally returned to the sea. The Bretons believe in mermaids which sing and comb their golden hair, and draw down to their palaces of gold and crystal at the bottom of the sea those who venture imprudently into the water. The merrows of Irish legends are mermaids. Capt. Whitbourne minutely describes a mermaid seen by him in 1610 in the harbor of St. John's, Newfoundland. Monsters of similar appearance have since been occasionally described; but it is affirmed by Sir Humphry Davy that a human head, human hands, and human mammae are wholly incompatible in the same creature with a fish's tail. Tennyson and other poets have availed themselves of the fiction.

MEROË, an ancient kingdom of Ethiopia in Africa, comprising the peninsula formed by the junction of the Nile and its tributaries, the Atbara and Bahr-el-Azrek, between lat. 18° and 18° N., and included in modern times in Nubia and Sennaar. By the ancients this peninsula was termed an island, and at certain seasons it becomes one by the overflowing of the rivers. It has on the E. the Abyssinian mountains, and on the W. the desert of Bahiouda. Its length from N. E. to S. W. is about 375 m., and its breadth about 200; and it consists of extensive plains, which formerly were fertile and well cultivated, but are now for the most part desert. This country was very famous in antiquity. It produced gold, iron, copper, and salt; and partly from its natural riches, and partly from its situation between Ethiopia and the Red sea, it was from the earliest times the seat of a great commerce, carried on by caravans from all parts of northern Africa, which made its chief city their central rendezvous. Meroë, the capital of the kingdom, was a large and rich city on the Nile, about 90 m. N. of the modern Khartoom, between lat. 16° and 17° N. Here have been discovered the ruins of temples in the Egyptian style, and about 80 pyramids, the largest of which is 160 feet high. It was for a long time a favorite theory of historians and scholars that Egypt received its civilization and arts from Meroë; but these ruins indicate by their style and execution that Meroë was indebted to Egypt for its architecture and other arts. The political system of the kingdom was peculiar. It was ruled by priests, who elected the sovereigns from among themselves, and kept the royal power restricted within narrow bounds. They got rid of a king when they pleased by sending to him a messenger charged to tell him that the gods had decreed that it was time for him to die. For ages this intimation was implicitly obeyed, and the monarchs thus warned put themselves to death. It was a remarkable feature that the sceptre was often held by female sovereigns, the surviving widows of deceased

king. The history of Meroë is very obscure. It has been conjectured that the kingdom owed, if not its origin, at least its peculiar polity and civilization, to the Egyptian soldiers who, according to Herodotus, emigrated from their country and went up the Nile to the number of 240,000 in the reign of Psammeticus (658-614 B. C.), because their privileges had been violated by that monarch. During the Persian occupation of Egypt, Meroë was an independent and important state. An attempt to subdue it made by Cambyzes at the head of a large army totally failed. The theocratic government continued till the 8d century B. C., when Ergamenes, a native Ethiopian who had received a Greek education, became king. His mind, enlightened by Greek philosophy, was not subject to the superstitions that had enslaved his predecessors; and when the priests directed him to commit suicide he rebelled against the decree, and caused his army to massacre the priests. After this event little is known of the history of Meroë.

MEROPIS. See Oos.

MEROVINGIANS, the name of the first Frankish dynasty in Gaul or France. It was so called from Meroveus, king of the Riparian Franks (448-58), who aided in the defeat of Attila in 451. He was succeeded by Childeric I. (458-81), whose son Clovis, the conqueror of Gaul, and the first Christian monarch of the Franks, left his possessions in 511 to his 4 sons Thierry or Theodoric, Chlodomer, Childebart, and Clotaire, the first receiving the east (Austrasia), the 2d the south west (with Orleans), the 3d the centre (with Paris), and the 4th the north-east (with Soissons). The line of Thierry became extinct with his grandson Theodebald, son of Theodebert. The sons of Chlodomer were murdered, and Childebart left no male issue. Thus Clotaire, the youngest son of Clovis, reunited the empire of the Franks (558-61). On his death it was again divided by his 4 sons, Charibert reigning in Paris, Gontran or Guntram in Orleans (to which Burgundy, a new conquest, was attached), Siegbert in Austrasia, and Chilperic in Soissons. This period was distracted by internecine wars, during which the two princesses Brunehaut and Fredegonda, the wives of Siegbert and Chilperic, were the most conspicuous characters. Siegbert was assassinated, and his son Childebart, who also inherited the possessions of Gontran, was succeeded by two sons, Theodebert and Theodoric, who died without legitimate male issue. Clotaire II., the son of Chilperic and Fredegonda, reunited the whole kingdom. It was again divided in 628 by his sons Dagobert and Charibert, the former of whom was the founder of a line of kings known as *fainéants* (lazy), their mayors of the palace being the real rulers of France. They were as follows: Siegbert II., king of Austrasia, 638-56; Clovis II., of Neustria (the western kingdom) and Burgundy, 638-56; Clotaire III., sole king, 656—of Neustria and Burgundy, 660-70; Childeric II., of Austrasia, 660-70—sole king 670-73; Thi-

erry or Theodoric III., of Neustria and Burgundy, 670-'91; Dagobert II., of Austrasia, 674-'9; Clovis III., of Neustria and Burgundy (like all the succeeding), 691-'5; Childbert III., 695-711; Dagobert III., 711-'15; Chilperic II., 715-'20; Thierry IV., 720-'87; Childeric III. 742-'52—deposed by Pepin the Short, founder of the Carolingian dynasty.

MERRICK, JAMES, an English poet, born in Reading in 1720, died there in 1769. He was educated at Trinity college, Oxford, of which he became fellow in 1744. When only 14 years old, he published "The Messiah, a Divine Essay." While at Oxford he was tutor to Frederic North, afterward prime minister. He took orders, but from delicate health was unable to perform his clerical duties. His most important works are: "Prayers for a Time of Earthquakes and Floods" (London, 1756); "The Psalms Translated or Paraphrased in English Verse" (Reading, 1766); "Annotations on the Psalms" (Reading, 1768). His poetical fable, "The Chameleon," is now the best known of his works.

MERRIMACK, a river of New England, formed by the junction of the Pemigewasset and Winnipiseogee rivers at Franklin, N. H. From this point the river runs S. 78 m. to Chelmsford, Mass., and thence E. 35 m. to the Atlantic ocean at Newburyport; total length 118 m. Its tributaries in New Hampshire are the Contoocook, the Soucook, the Suncook, the Piscataquog, the Souhegan, and the Nashua; in Massachusetts, the Concord, Spigot, Shawshine, and Powow. The principal tributaries are on the right side of the river. There are numerous falls in the Merrimack, and the river furnishes an immense water power, the employment of which in manufacturing has created the cities of Lowell and Lawrence, Mass., and Nashua and Manchester, N. H. The Merrimack is a noble river, with pure waters and beautiful and well peopled borders. Its width varies from 50 to 150 rods. The name is of Indian origin, and is derived from a word signifying a sturgeon.

MERRITT, TIMOTHY, an American clergyman, born in Barkhamstead, Conn., in Oct. 1775, died in Lynn, Mass., in 1845. He became a minister of the Methodist Episcopal church in 1796. He edited for some time "Zion's Herald" at Boston, and the "Christian Advocate and Journal" at New York, and published "The Christian's Manual," "Convert's Guide and Preacher's Assistant," "Universal Salvation," and "Mémorial of Miss H. S. Bunting."

MERSEBURG, a district of Prussian Saxony; area, 8,994 sq. m.; pop. in 1852, 756,846. The surface toward the E. is mostly level, but toward the W. is rather mountainous. The soil is generally good. The minerals are of great value, and include silver, lead, copper, iron, coal, and lignite. The principal rivers are the Elbe, Mulde, and Saale. The capital, Merseburg, is on the left bank of the Saale, 15 m. W. from Leipsic; pop. 12,500. It is fortified, and

was formerly one of the most important towns of Germany, but has much declined.

MERSEY, a river of England, formed by the union of several small streams, which have their sources in the hills near the borders of Yorkshire, Cheshire, and Derbyshire. The two principal of these, the Tame and the Goyt, after receiving the tributary waters of all the rest, unite at Stockport. Here the river takes the name of Mersey, and flowing W. divides Cheshire from Lancashire, and falls into the Irish sea below Liverpool. The chief affluents of the Mersey are the Irwell and Weaver. At Runcorn, about 17 m. from its mouth, it expands into a large estuary, which varies in breadth from 2 to 8 m., and contracts at its mouth to about $\frac{1}{2}$ m. The course of this river is mostly through a level country, but its scenery is occasionally very picturesque. The principal towns on its bank are: Stretford, Warrington, Hale, Garston, and Liverpool, on the right bank; and Stockport, Runcorn, Ince, and Birkenhead on the left. Its entire length is from 55 to 60 m., for the greater part of which it is navigable.

MERTHYR TYDVIL, a parliamentary borough of Glamorganshire, South Wales, 21 m. N. by W. from Cardiff, with which it is connected by the Cardiff canal and the Taff Vale railway, and 171 m. W. by N. from London; pop. in 1851, including the adjoining town of Dowlais, 63,080. It is in the midst of the great mineral region of South Wales, and has attained its present importance during the last 100 years, previous to which it was a mere village. It is irregularly and poorly built, and deficient in cleanliness, but gradually improving. In 1851 it contained 84 places of worship, of which 20 belonged to the Independents, 19 to the Baptists, 10 each to the Church of England, Wesleyan Methodists, and Welsh Calvinistic Methodists, and 6 to the Mormons. There were 16 public schools with 2,544 pupils, and 43 private schools with 1,185 pupils. It has many extensive iron works, one of which, at Dowlais, when in full work, employs 6,000 men; and the annual production of iron is about 200,000 tons.

MERU. See DEMON.

MÉRY, JOSEPH, a French poet and novelist, born in Ayalades, near Marseilles, Jan. 21, 1798. He made his first appearance as an author in 1820 by the publication of a satire in verse against the abbé Elicagaray, for which he was sentenced to 15 months' imprisonment. Subsequently he became attached to the *Phocéen*, a liberal sheet published in Marseilles, which he abandoned to found a journal of his own, the *Méditerranée*. Both were soon after merged in the *Sémaphore*. In 1824 he established himself in Paris, and became the intimate associate of Armand Carrel, Victor Hugo, and particularly of Auguste Barthélemy, with whom he entered into a sort of literary partnership, founded upon common animosity toward the existing government, and which for several years was the fruitful source of satirical and political poems. The first offspring of their united

talents was the *Réponse de Sidi Mahmoud*, a witty satirical poem, succeeded in 1826 by the *Villéliade*, an attack on the ministry of Villèle, which brought them in 25,000 francs, and made a decided impression. *Rome à Paris* and *La Peyronnéide*, published in the following year, were equally effective, and aided in the overthrow of the unpopular minister. They next wrote in a higher strain their poem, *Napoléon en Égypte*, a subject which the strong Bonapartist sympathies of Méry enabled him to treat with peculiar vigor. The revolution of July, 1830, was commemorated by them in a poem, *L'insurrection*, and a hymn, *La tricolore*, set to music by Halévy. They subsequently founded the *Néméide*, which for upward of a year was the weekly receptacle of their stinging assaults upon the government of Louis Philippe. Upon the discontinuance of the paper Méry went to Italy, whither he had been invited by Queen Hortense and other members of the Bonaparte family. Scarcely known hitherto except as a poet, he now commenced the career of a romance writer, and produced in rapid succession a number of works founded partly on his observations of Italian life. A trip to England furnished him with the materials for his *Nuits de Londres* (1840), and he subsequently published in the *Presse* newspaper of Paris *Héva*, *La guerre de Nisam*, and *La Floride*, describing India and Africa, countries which he had never seen. With equal confidence he sketched China and the Chinese in his *Anglais et Chinois* (1848). He is the author of numerous prose pieces originally published as *feuilletons*, and of several dramas, the latter being the least successful of his performances. As a romance writer he is distinguished by quickness of invention and facility of composition, and by a warmly colored but capricious and affected style. His verses are neatly written, and have much melody of rhythm. His devotion to the Bonaparte family has been testified by the production of several poems written since the *coup d'état* of 1851, in praise of the emperor Napoleon III.

MESILLA, a town and valley N. of El Paso, on the W. bank of the Rio Grande of New Mexico. It obtained notoriety from a dispute between the United States and Mexico in the settlement of the boundary under the treaty of Guadalupe Hidalgo, made in 1848. It was subsequently purchased by the United States by the "Gadsden treaty" of 1853, including the territory lying to the W. as far as the Colorado river and gulf of California. Mesilla is the diminutive of the Spanish *mesa*, table; as here applied, it means a small plateau, or table-land, on the bottom land of the Rio Grande, to distinguish it from the great table-land which is more elevated, and which extends for many hundred miles on both sides of the river. The Mesilla valley is a rich alluvium, while the great plateau is not susceptible of cultivation, although portions of it consist of grazing lands. The valley, of which the Mesilla is a part, is about 80 m. in length, with a breadth of from

1 to 3 or 4 m., and is simply the bottom land of the Rio Grande. Although the soil is rich, it cannot be cultivated without artificial irrigation; but the water of the Rio Grande is insufficient to irrigate the whole of the bottom lands on both its sides. The town was settled in 1850, and now has a population of about 2,500.

MESMER, FRIEDRICH ANTON, a German physician, the first promoter of animal magnetism, or, as it has been called, "mesmerism," born in Meersburg, Baden, on the lake of Constance, in 1734, died there, March 5, 1815. He studied physic in Vienna, and took his degree of M.D. there in 1766, presenting on that occasion a thesis *De Planetarum Influxu in Corpus Humanum*, in which he held that the universe is pervaded by a subtle element exercising an extraordinary influence on the human body, and identical with the magnetic element. The means by which he brought his theory into notice and practical operation, as well as the leading features of his life, will be found detailed at length under the head of ANIMAL MAGNETISM.

MESMERISM. See ANIMAL MAGNETISM.

MESOPOTAMIA (Gr., between the rivers, viz., Euphrates and Tigris; Heb. *Aram Naharaim*, Syria between the two rivers; now *Al Jezira*, the island), an ancient country of western Asia, bounded, according to the common acceptance of the name, N. by Armenia, from which it was separated by the Masius range, a branch of the Taurus; E. by the Tigris, separating it from Assyria; S. by Babylonia; and W. by the Euphrates, separating it from Syria. The Greek name was first used in the time of the Seleucidae, being mentioned neither by Herodotus, in whose time the country formed a part of the Persian satrapy of Babylonia, nor by Xenophon, who extends the limits of Syria across the Euphrates. Polybius and Pliny use the name in a wide sense. Excepting the Masius range and its prolongation parallel to the upper Tigris, Mesopotamia formed a vast and mostly very fertile plain, well watered by rivers and canals, the chief affluent of the two great rivers being the Chaboras, and the principal productions of the country grain, fruits, spices, timber, cattle, naphtha, and jet. The southernmost part of the plain, however, resembled the adjoining region of the Syrio-Arabian desert, and was inhabited by numerous wild animals, including lions, ostriches, and wild asses. Among the cities of Mesopotamia were: Apamea on the Euphrates, opposite Zeugma in Syria; Edessa (now Orfa), the capital of the north-western province of Osroene; Carræ or Carrhæ, the Haran of Abraham; Circesium, the scriptural Carchemish, near the mouth of the Chaboras; Nisibis, the scriptural Zoba, in the north-eastern province of Mygdonia; Dura, in the desert. Mesopotamia was inhabited in the earliest times by numerous tribes of various race, none of whom succeeded in establishing an important state. In historical times it was in turns a part of the Assyrian, Babylonian,

Persian, Macedonian, Syrian, Parthian, and Neo-Persian monarchies, until it was conquered by the Arabs. It was subsequently invaded by the Seljooks, conquered in part by the crusaders, and finally became a province of the Ottoman empire.

MESSALA, or **MESSALLA** (**MARCUS VALERIUS MESSALA CORVINUS**), a Roman general, orator, and author, born, according to Eusebius, in 59, but according to Scaliger about 70 B. C., died about the beginning of the Christian era. He completed his studies at Athens, and on the outbreak of the 2d civil war joined Brutus and Cassius in the East, and was appointed to the 8d rank in the republican army. At the first battle of Philippi he stormed the camp of Octavius, and almost took him prisoner. After the overthrow of his party he surrendered to Antony, to whom he attached himself until, perceiving the ruin of that triumvir inevitable, he withdrew from his service, and entered that of his rival, for whom he fought in Sicily, against the Salassi in the Alps, and at Actium. In 81 B. C. he was appointed to succeed Antony as consul, and subsequently obtained the proconsulship of Aquitania, for the reduction of which province a triumph was decreed him. He was selected by the senate to greet Augustus with the title of *pater patriæ*, and the exordium of his oration has been preserved by Suetonius. Soon after this Messala resigned all his official dignities except the augurship, a special appointment of his patron, and retired to private life. Only fragments of his orations remain (Paris, 1842); his other writings are only known by their titles.

MESSALINA, or **MESSALLINA**, the name of two Roman empresses, who lived in the 1st century of the Christian era. I. **VALERIA**, daughter of M. Valerius Messala Barbatus, and 8d wife of Claudius I., to whom she was married before his accession to the empire. She was a woman of very profligate character, and as cruel as profligate. Many members of the most illustrious families of Rome were sacrificed to her fears, her jealousy, or her hatred. Among her noblest victims were the two Julias, one the daughter of Germanicus, the other of Drusus, son of Tiberius, who had excited her jealousy or envy; O. Appius Silanus, who had wounded her vanity by rejecting her advances; and Justus Catonius, whose offence was privacy to her guilt. For a long time Claudius was blind to her infidelity; but when, during his absence at Ostia, she contracted a public marriage with Caius Silius, a handsome youth for whom she had conceived a violent passion, he caused her to be put to death. The sentence was executed in A. D. 48, by a prætorian tribune, in the gardens of Lucullus. She was the mother of two children by Claudius, Britannicus and Octavia. II. **STATILIA**, the 8d wife of the emperor Nero, and the granddaughter of Titus Statilius Taurus, who had been consul in A. D. 11. She was first married to Atticus Vestinus, but the tyrant caused her husband to be put to death, and

espoused her in 66. She survived Nero, and would have been wedded to Otho had he been successful in the war against Vitellius.

MESSANA. See **MESSINA**.

MESSENE, the capital of Messenia in Peloponnesus, founded by Epaminondas after his victory of Leuctra over the Lacedæmonians, and situated at the foot of the hill of Ithome, the fortress of which formed the acropolis of the new capital. The latter was surrounded by massive stone walls, flanked with towers, of which there are still considerable remains at the modern village of Mavromati. Messene with its acropolis was, next to Corinth, the strongest city of Peloponnesus. It was supplied with water from a fountain called Clepsydra, the spring of which still exists.

MESSENIA, or **MESSENE**, the S. W. division of Peloponnesus in ancient Greece, bounded N. by Elis, from which it was separated by the river Neda, and Arcadia; E. by Laconia, the boundary line varying at various periods; and S. and W. by the sea, which on the S. forms the large gulf of Messenia, or, as it is now called, of Coron. It is a mountainous country, containing but two plains of any extent, the southern of which, traversed by the Pamisus, was called Macaria or the Blessed on account of its great fertility. The valleys among the mountains, too, were regarded as fertile, and the whole country was renowned for the mildness of its climate. Among the few towns of note were Pylos, a seaport, according to some the seat of Nestor, Cyparissia, Corone (now Coron), Methone (Modon), Abia, Derna, Stenyclerus in the northern plain of the same name, and the later capital Messene, founded by Epaminondas, beside the mountain fortresses of Ithome and Ira, so celebrated in the history of the Messenian wars. The earliest inhabitants of Messenia were Leleges and Argives. Polycæon, son of Lelex, is said to have given the country its name from Messene, his wife, daughter of the Argive Triopas. It was subsequently settled by Æolians. During the following period Messenia seems to have belonged partly to the kingdom of Pylos and partly to that of Lacedæmon. When the Dorians conquered Peloponnesus, it became the possession of Cresphontes, who destroyed the kingdom of Pylos. Of the kindred Dorian states, Sparta, the eastern neighbor, soon developed its aggressive policy, and after various collisions and mutual inroads the first Messenian war broke out in 743 B. C. It lasted 20 years, and ended with the fall of Ithome and the subjugation of Messenia, its gallant resistance under Aristodemus, who sacrificed his daughter to the freedom of his country, and finally killed himself on her tomb, being of no avail. Part of the inhabitants sought refuge in other countries. After 38 years of subjection, the Messenians rose under the lead of the heroic royal youth Aristomenes, being supported by Argos, Arcadia, and other states of Peloponnesus, while their enemies received the support of Corinth, and after many defeats were unexpectedly aided by

the wisdom and inspiring songs of the Athenian Tyrtaeus. Thus Aristomenes, too, succumbed after a struggle of 17 years (668), and Ira fell. New emigrants now settled in Italy and Sicily, giving the name of Messana to the town of Zancle in that island. The remaining inhabitants were reduced by the conquerors to the condition of helots. Together with the other slaves of Sparta, they were induced by the great earthquake which devastated the capital of their oppressors in 464 to strike once more for freedom. This third Messenian war lasted 10 years, and was terminated by the capitulation of the defenders of Ithome, who were allowed a free departure from Peloponnesus. They settled at Naupactus, on the northern shore of the Corinthian gulf, a town recently conquered by Athens, now the declared rival of Sparta. When the former was finally crushed by the fatal issue of the Peloponnesian war, the Messenians of Naupactus were compelled to leave Greece. The noblest enemy of Sparta, the Theban Epaminondas, finally restored the independence of Messenia, convoking the refugees from the various lands of their exile, after the great battle of Leuctra (371), and giving the country a strongly fortified capital in Messene, a new town at the foot of the old stronghold Ithome (369). From this period the Messenians maintained their independence down to the time of the Roman conquest of Greece in 146.

MESSER, ASA, D.D., LL.D., an American clergyman, born in Methuen, Mass., in 1769, died in Providence, R. I., Oct. 11, 1836. He was graduated in 1790 at Brown university, where the next year he was chosen tutor, and in 1796 was elected professor of the learned languages, in 1799 professor of mathematics and natural philosophy, and in 1802 president of the university. He held this position for 24 years, when he resigned. He was licensed to preach by the 1st Baptist church in Providence in 1792, and ordained in 1801. He preached occasionally for congregations of different denominations, but was never settled as a pastor. The citizens of Providence for several years elected him to important civil offices. Three of his discourses and 5 orations have been published.

MESSIAH. See JESUS CHRIST.

MESSINA, a province of Sicily, including the N. E. extremity of the island, bounded N. by the Mediterranean, E. by the strait of Messina, which separates it from Calabria, S. by the province of Catania, and W. by that of Palermo; area, about 1,600 sq. m.; pop. in 1856, 384,664. It is traversed from E. to W. by the Neptunian mountain range, and by the Monforte, San Antonio, and a number of other small streams. The mountains abound with wood. There are no large plains, but many valleys, which as well as the banks of the rivers are very fertile in wine, oil, and fruit of every sort, particularly oranges. The other principal products are hemp and flax. The most important mineral product is sulphur. On the S. a portion of the province skirts the base of Mt. Etna.

It is divided into 4 districts, 29 arrondissements, and 98 communes, and includes the Lipari islands. The chief towns, beside Messina, the capital, are Castro Reale, Melazzo, Patti, Randazzo, and Taormina.—MESSINA (anc. *Messana* or *Messene*), the capital of the above province, is situated on the N. E. corner of the island, on the strait of Faro or Messina, here about 4 m. wide, 120 m. E. by N. from Palermo, and 50 m. N. E. from Mt. Etna; pop. about 100,000. The approach from the sea is of remarkable beauty, the city rising from the shore in the form of an amphitheatre, and the dazzling whiteness of the houses presenting a picturesque contrast to the dark mountains in the background. The principal part of the city is built on the W. side of the harbor, paved with square blocks of lava, and contains several wide and handsome streets ornamented with statues and fountains. Among the public buildings are more than 50 churches, the most ancient of which is the cathedral, the arsenal, the naval arsenal, the viceroy's palace, the archbishop's palace, the senate house, the custom house, a large hospital, 2 theatres, a lazaretto, and numerous convents and nunneries. Messina is the seat of an archbishop and of a Greek *protopapas*, who is nominated by the pope and exercises authority throughout Sicily. It has a royal court of appeal and other courts of law, an exchange, and several banks and *monti di pietà*. The harbor is one of the finest in the world, and the port has been free since 1852. It is defended by several forts, extends about 4 m. in circuit, and can accommodate the largest fleet. The principal exports are oranges, lemons, currants, raisins, wine, brandy, olive oil, linseed, sumach, liquorice, rags, and corn. Nearly all the silk exported from Sicily is shipped from Messina. The imports are colonial produce, cotton and woollen fabrics, hides, and hardware. The exports from Messina to the United States amounted in 1857 to \$679,364, and in 1858 to \$524,698; they consisted of lemons, oranges, filberts, wine, brimstone, almonds, essences, &c. The imports from the United States decreased from \$42,830 in 1857 to \$18,280 in 1858, and included staves, rosin, rum, tobacco, &c. The principal manufactures of Messina are damasks and satins. Coral, tunny, and other fisheries are extensively carried on. Messina is defended by walls and bastions, a citadel, and many forts, and is considered a fortress of the highest importance, as commanding the strait of its name, and thus being the principal gate to Sicily from the mainland.—The origin and early history of the ancient city are involved in obscurity. It is believed to have been founded by colonists from Magna Græcia and Greece between 1000 and 800 B. C., to have made rapid strides in prosperity, and to have derived its name from a body of emigrants from Messene in Greece, the original name having been, according to Thucydides, Zancle, after the similar Greek word signifying a sickle (the form of the harbor). In 896 B. C., when the city was celebrated for its flourishing trade, a

Carthaginian army landed in Sicily and destroyed the city, which was the next year rebuilt by Dionysius of Syracuse, who expelled the invaders. About 280 B. C. it was seized by the mercenaries expelled from Syracuse on the death of Agathocles, who were called Mamertini, children of Mamers or Mars, and who subsequently, in order to maintain themselves in power, applied for assistance to the Romans; hence arose the first Punic war, in the course of which the city was taken by its allies, and thus became the earliest dependency of Rome beyond the Italian continent. Cicero calls it a very great and very rich city, and speaks highly of the advantages of its port and of its situation. In the civil war (48 B. C.) it was the station of a part of the fleet of Cæsar, and Sextus Pompey after his defeat by the fleet of Octavian under Agrippa made his escape from thence with only 17 ships. The famous wine of the neighborhood of Messina (*vinum Mamertinum*) was first brought into vogue by Julius Cæsar. During the middle ages Messina continued to be an important city. To avenge the massacres of Sicily it was besieged by Charles of Anjou, king of Naples, but relieved in 1282 by Peter of Aragon and Roger de Loria. In 1678 it submitted to Louis XIV., but he was compelled to withdraw his forces by the Dutch and Spanish fleet, and the citizens were severely punished. In 1698 it was nearly destroyed by an earthquake and an eruption of Mt. Etna, and in 1740 it was afflicted by the plague. Another earthquake in 1788 destroyed and depopulated almost the whole city, and it has since been rebuilt upon a better plan. A revolutionary outbreak took place there in 1848, but the insurgents were put down by the Neapolitans (Sept. 7). The possession of Messina during the war of that year enabled the king of Naples to reconquer the island. Every attempt at a popular movement was therefore punished with the utmost rigor, a strong garrison continually kept there, and the fortifications of the place strengthened. In 1860, however, the victorious advance of Garibaldi's army made all precautions vain, and after the victory at Melazzo (July 20) the revolutionary army entered the town, and an agreement was soon after entered into by Gen. Medici with Clary, the commander of the royal troops, according to which the citadel and 3 forts were to remain in the hands of the latter, and the town and 2 forts in the undisputed possession of the Sicilians.

MESTIZO, a Spanish-American term for the mixed offspring of Europeans and Indians. In Mexico mestizoes are very numerous. Their color is almost a pure white, with a skin of remarkable transparency. The chief indications of the mixture of Indian blood are a thin beard, small hands and feet, and an obliquity of the eyes. The women of this race are called *mestizas*, and the offspring of their marriages with whites differ but slightly from pure Europeans.

MÉSZÁROS, LÁZÁR, a Hungarian general, born in Baja, county of Bács, Feb. 20, 1796,

died at Eywood, Herefordshire, England, Nov. 16, 1858. He came of a poor but noble family, and being left an orphan at a tender age, was educated under the care of some relatives for an ecclesiastical career, and subsequently studied law at Pesth; but in 1813, on the outbreak of the new war against Napoleon, he entered the Hungarian army in the service of the emperor Francis. He fought with distinction in the last campaigns against Napoleon, and subsequently in Italy, and in 1845 attained the rank of colonel in a hussar regiment. He was in Italy in the spring of 1848, when during the retreat of Radetzky from Milan he received the first information of the important changes in Hungary, and was soon after offered the ministry of war in the cabinet of Batthyányi. He hesitated from modesty to accept it, but finally started for Pesth, where he soon learned the immense difficulties of his new position. Elected a member of the diet, he defended the moderate measures of the ministry, and was exposed to attacks on the part of the more revolutionary members, especially Perczel. Repairing personally to the scene of war in the south, he gave ample proofs of intrepidity, but failed in his attempts to storm the Rascian ramparts of Szent Tamás (September). The treachery of the Vienna cabinet and of the Austrian officers, who serving under him only checked his movements, threw him on the revolutionary side when Austria finally avowed the purpose of subjugating Hungary. In December he again took the field in the north, whither he was sent to check the advance of Schlick; but after an indecisive encounter at Szikszó (Dec. 28), his motley army suffered a total rout before Kaschau (Jan. 4, 1849). His well known patriotism and frankness in acknowledging his incapacity to lead an army saved him from all dishonorable imputations; and by his witty addresses in the national assembly at Debreczin he even secured a lasting popularity. When the difficulties with Görgey compelled Kossuth to appoint a new commander-in-chief, the title was given to Mészáros and the real command to his friend Dembinski, with whom Mészáros soon after shared in the defeats at Szőreg (Aug. 5) and Temesvár (Aug. 9), and a few days later in Turkish exile. Accompanying Kossuth to Widdin, Shumla, and Kutaieh, he was allowed in May, 1851, to depart for England, where he was cordially received. Having lived for some time in France, he repaired to the island of Jersey after the *coup d'état* of Dec. 2, 1851, and in the summer of 1858 sailed to America. He enjoyed the quiet tranquillity of a home at Flushing, L. I., until he received the rights of American citizenship, when he started on a tour to Switzerland, where a number of his exiled friends resided; but he died a few days after his arrival in England, at the mansion of Lady Langdale, the mother-in-law of his countryman Count Teleky. One of the most dignified representatives of his nation in exile, his sudden death was deeply regretted by his fellow patriots. He left various writings, published and unpublished.

METAL (Gr. *μεταλλον*). All simple substances are commonly classed as metals and metalloids. Those of the former division are distinguished by their brilliant peculiar lustre, called metallic, by their being good conductors of electricity and heat, and always appearing when their compounds are decomposed by the electric current at the cathode or negative pole—hence being all electro-positive or cations. The common metals may also for the most part be recognized by their high specific gravity, and many by the properties of malleability and ductility, by which they can be extended under the hammer and drawn out into wire. They are opaque, and even when converted into exceedingly thin leaves but rarely transmit light, and then very feebly and but a portion of the ray. The luminous rays, not being transmitted by reason of the opacity of the substance, are reflected from the polished surface which the metals readily take, and hence the lustre these possess. This is one of the most striking characteristics of the metals, and is readily developed even in their fine dust, when this is rubbed with an agate burnisher. It is most perfect in polished steel and the brilliant surface of mercury, as seen upon the backs of mirrors where the metal is protected from tarnishing. The reflected light with most of the metals is whitish with a shade peculiar to each metal; gold, however, is yellow, and copper and titanium red. A few possess a peculiar odor when rubbed, as copper and iron, and arsenic when oxidized and converted into vapor. Some also impart to the tongue a taste called metallic, which is more perceptible in their soluble compounds. The distinctive properties of the metals cannot be strictly defined; and the division of simple bodies into metals and metalloids is to some extent an arbitrary one. Several in fact possess properties according to which they might be referred to one or the other class. Thus arsenic is called a metal by some chemists, and by others is ranked with the metalloids. Phosphorus, though always classed as a metalloid, resembles arsenic in its chemical properties, and has a decided metallic lustre. So carbon in the state of graphite appears like a metal, and in strongly calcined charcoal is a good conductor of electricity; it is, however, always regarded as a metalloid. Tellurium, arsenic, antimony, and tungsten (to which group bismuth has recently been added) may be considered half metals, marking the transition between the two great classes of simple bodies.—The metals are usually reckoned as 48 in number, and exceed considerably the non-metallic bodies. Among them are many scarcely known except to one or two chemists, who have separated them from their rare native combinations; they consequently possess none but a scientific interest. Some of these, however, may hereafter become of importance, as aluminum now promises to, which a few years since was one of the rarest. The names of the metals and of their discoverers, so far as known, are given in the following table:

| Name. | Date of discovery. | By whom discovered. |
|-----------------|--------------------|---|
| Gold..... | .... | Known to the ancients. |
| Silver..... | | |
| Iron..... | | |
| Copper..... | | |
| Mercury..... | | |
| Lead..... | | |
| Tin..... | 1490 | Described by Basil Valentina. |
| Antimony..... | | |
| Bismuth..... | 1529 | Described by Agricola. |
| Zinc..... | 16th century | First mentioned by Paracelsus. |
| Arsenic..... | 1783 | Brandt. |
| Cobalt..... | | |
| Platinum..... | 1785 | Ulloa, a Spanish travel- ler in America. |
| Nickel..... | 1751 | Cronstedt. |
| Manganese..... | 1774 | Scheele and Gahn. |
| Tungsten..... | 1781 | D'Elhuyart. |
| Tellurium..... | 1782 | Müller. |
| Molybdenum..... | 1782 | Helm. |
| Uranium..... | 1789 | Klaproth. |
| Titanium..... | 1791 | Gregor. |
| Chromium..... | 1797 | Vauquelin. |
| Tantalum..... | 1802 | Hatchett. |
| Palladium..... | 1808 | Wollaston. |
| Rhodium..... | | |
| Iridium..... | 1808-'4 | Descottis and Smithson Tennant. |
| Osmium..... | 1808 | Smithson Tennant. |
| Cerium..... | 1808 | Hisinger and Berzelius. |
| Potassium..... | 1808 | Davy. |
| Sodium..... | | |
| Barium..... | | |
| Strontium..... | | |
| Calcium..... | | |
| Cadmium..... | | |
| Lithium..... | 1817 | Stromeyer. |
| Zirconium..... | 1818 | Davy. |
| Aluminum..... | 1824 | Berzelius. |
| Glucinum..... | 1828 | Wöhler. |
| Yttrium..... | | |
| Thorium..... | 1829 | Berzelius. |
| Magnesium..... | 1829 | Bussy. |
| Vanadium..... | 1830 | Selfström. |
| Lanthanum..... | 1841 | Mosander. |
| Didymium..... | Since 1840 | Mosander. |
| Erbium..... | | |
| Terbium..... | 1840 | Klauss. |
| Ruthenium..... | 1844 | |
| Pelopium..... | 1845 | H. Rose. |
| Niobium..... | | |

To this list of metals is now to be added a new one belonging to the group of niobium, tantalum, &c., discovered by Von Kobell in 1860, and termed by him dianium. It exists in an acid combination separated by Von Kobell from the minerals euxenite, ceschynite, samarskite, and a tantalite from Tammela. (*Bulletin der Akademie der Wissenschaften*, March 10, 1860.) The chemical equivalents of these elements are given in the article EQUIVALENTS, and the densities of the most important of them in the article GRAVITY, SPECIFIC. The arrangement of 18 of the principal metals according to their electro-chemical character is given in ELECTRO-DYNAMICS, vol. vii. p. 65; but it must be remembered that this order is not invariable under all circumstances. Their other individual properties are treated in the articles describing each metal under its own head. The properties of density, hardness, ductility, tenacity, fusibility, &c., are very variable among the different metals. Platinum (sp. grav. 21.5), iridium (23?), and gold (19.8) present the heaviest forms of matter; while the specific gravity of lithium is only 0.598, or but little more than half the density of water. Metals having the great-

est affinity for oxygen, as potassium (sp. grav. 0.865), sodium (0.972), calcium (1.578), &c., are distinguished by their low densities; and those which are least oxidizable by their great densities. The range of hardness is from that of titanium and manganese, which are harder than steel, to potassium and sodium, which at 60° are as soft as wax, and even to mercury, which is a liquid at ordinary temperatures. The ductility of metals, tested by drawing them into wire, is possessed by the following in the order in which they are named, the first in the highest degree: gold, silver, platinum, iron, nickel, copper, zinc, tin, lead, palladium, cadmium. But according to the strength of the wires, or the property of tenacity, the arrangement will be very different. This property differs indeed in the same metal according to its purity and the mode in which it has been prepared. The following weights were sustained by wires 0.787 of a line in diameter: iron, 549.250 lbs.; copper, 302.278; platinum, 274.320; silver, 187.187; gold, 150.758; zinc, 109.540; tin, 84.630; lead, 27.621. A number of the metals are brittle, and some may be rubbed to powder. The effects of heat upon the different metals are variously manifested. Gold, silver, and copper transmit it quickly, while the conducting power of iron, platinum, zinc, tin, and lead is comparatively feeble. When their temperature is raised from 32° to 212°, their linear expansion is as follows: of Malacca tin, $\frac{1}{18}$; hammered zinc, $\frac{1}{12}$; cast do., $\frac{1}{17}$; silver, $\frac{1}{24}$; lead, $\frac{1}{11}$; copper, $\frac{1}{12}$; gold, $\frac{1}{11}$; iron, $\frac{1}{12}$; palladium, $\frac{1}{10}$; platinum, $\frac{1}{10}$. All may be fused, but the temperatures required are very various. (See FUSIBILITY.) Platinum and a number of the rare metals are melted only by the intense heat of the compound blowpipe, sodium and potassium respectively at 190° and 186° F.; and mercury assumes the solid state only when the temperature is reduced 89° or more below zero. Arsenic volatilizes before it fuses, and many of the metals are rendered more or less volatile by higher temperatures than are required for their fusion. The combinations of metals with each other have been treated under ALLOYS; or, when mercury is one of the combining metals, under AMALGAM. All the metals may be made to combine directly or indirectly with oxygen. Some become oxidized by exposure to the air, a few absorb oxygen with the phenomenon of combustion when thrown upon water, and many burn vividly when heated and introduced into oxygen. The arrangement by Thénard of the metals into six groups (*Annales de chimie et de physique*, vol. lxii. p. 868) is founded on their different affinities for oxygen. They are: 1. Metals which decompose water even at 32° with lively effervescence, viz.: potassium, sodium, lithium, barium, strontium, calcium. The first three of these are called metallic bases of the alkalies; the last three the metallic bases of the alkaline earths. 2. Those which decompose water rapidly only at a heat approaching 212° or above this; as manga-

nese, magnesium, aluminum, glucinum, zirconium, cerium, thorium, yttrium, and lanthanum. 3. Those which in solid masses do not decompose water except at a red heat, or at ordinary temperatures, when a strong acid is added to the water; such are iron, nickel, cobalt, zinc, cadmium, tin, chromium, and probably vanadium. When in a finely divided state these metals absorb oxygen much more energetically. 4. Those which at a red heat decompose steam with rapidity, but do not decompose water acidulated with strong acids. The oxides of these metals act feebly as bases, and are in fact ranked among acids. These metals absorbing oxygen at a red heat, their oxides cannot be reduced to the metallic state by heat alone. They are tungsten, molybdenum, osmium, tantalum, titanium, arsenic, antimony, tellurium, and uranium. 5. Those which decompose water only at very high temperatures and in a feeble manner, and which differ from those of the 4th group by forming basic and not acid oxides; they are copper, lead, and bismuth. 6. Metals, the oxides of which are reducible by heat alone, and which do not decompose water under any circumstances; they are mercury, silver, palladium, platinum, gold, and probably rhodium and iridium. The protoxides of the metals are uniformly and strongly basic, but in the high degrees of oxidation of which some metals are susceptible the combinations are of acid character. All the metals combine with sulphur, forming sulphurets or sulphides, and in this combination they are more commonly found in nature than in the metallic state or in other compounds.

METALLOID (Gr. *μεταλλον*, a metal, and *ειδος*, appearance; having a resemblance to a metal). In the classification of simple bodies, as observed in the preceding article, two divisions are recognized, the one of metals and the other of metalloids. The metallic bases of the fixed alkalies and alkaline earths have sometimes been called metalloids; but the bodies usually recognized by chemists as belonging to this division are the following: oxygen, hydrogen, nitrogen, sulphur, selenium, tellurium, chlorine, bromine, iodine, fluorine, phosphorus, (arsenic?), boron, silicon, carbon.

METALLURGY (Gr. *μεταλλον*, metal, and *εργον*, work), the art of the treatment of ores in order to obtain the metals they contain. The processes peculiar to each variety of ores are partially described in this work in treating of the metals, so that little more is requisite in this article than to allude to some of the general operations and the apparatus employed. But few metals are found in workable quantities "native" or uncombined; for an account of the mechanical processes in use for separating these, reference may be made to the article GOLD. As the ores are obtained from their veins, they are more or less mixed with stony matters called their gangue, beside being themselves chemical compounds of a metal with some substance, as sulphur, oxygen, carbonic acid, &c., in which state they have little of the metallic appearance,

often indeed nothing to suggest their containing any metal. In some of the ores that are profitably worked the proportion of the metallic ingredient is extremely small; of copper, as remarked in the article on that subject, 500 tons of ore are sometimes extracted from the mine and treated by various processes to obtain from it one ton of the metal. One per cent. of this metal, however, is usually the least quantity that admits of the products of the mine being designated workable ores.—Iron ores require at least 20 per cent. of metal; lead at least 3 per cent.; zinc 5 per cent.; silver $\frac{1}{10}$ per cent.; and gold $\frac{1}{100}$ per cent.—The character of the ores suggests two modes of treatment for freeing the metals from the foreign substances associated with them: the one a mechanical method, by which the stony gangue is separated; and the other a chemical process to break up the combination of the metal with its "mineralizer." In the mine itself, as the ore is extracted it is sorted, and the worthless pieces are left to fill up empty spaces and support the roof, while those of better quality are brought out to the surface and piled up. Here they are worked over, often by women and children, the large pieces broken by hand hammers, and the whole assorted into heaps of different qualities. To remove the clay and muddy portions, the ores are often washed in a stream of water running down an inclined trough, in which a man stands and with a shovel works over the piles as they are thrown in at the head, and, allowing the light matters to flow away, lifts the ore as fast as it is washed out upon the bank.—When ores are of a sulphurous or arsenical character, they commonly require to be roasted in order to drive off the volatile substances. For this purpose a great variety of ovens and furnaces are in use, some of which are designed also for condensing and saving these volatile matters. An account of this process is given in the article on COPPER SMELTING. After ores have been roasted, their condition is so changed, that more of the foreign earthy mixtures may be removed by washing, and this process may be therefore repeated to advantage. The operations that succeed are very various according to the kinds of ore. To separate more perfectly the gangue that is closely intermixed, the ores are commonly crushed more or less thoroughly between one or more pairs of cast iron rolls, or sometimes under heavy stamps, and the fine materials are subjected to a system of washings, so contrived that the light earthy and stony particles may be carried away, the heavier particles of ore alone remaining. The machines in use for these operations are chiefly of kinds long since introduced in the Cornish and other English mining districts; and it is but recently that the development of American mines has led to the devising of more efficient apparatus in some of the processes. For crushing large quantities of ores the English practice has been to multiply the number of stamps without attempting to increase their weight

above that always in use of 200 to 800 lbs. each stamp. In California it was soon found important to apply much greater power for crushing the quartz rock containing gold; and the weight of the stamps was soon increased to 500, 800, and even to 1,000 lbs. or more. The next great step was the introduction of the steam stamp (known as Ball's), which is worked somewhat in the same manner as the steam hammer. (See HAMMER.) An iron stamp head weighing with its iron rod 2,500 lbs. is raised by steam, which also is made to add to the impetus of its fall, and drops upon a bed which rests upon rubber springs, making with each stroke a quarter circuit around the mortar or bed, of which it covers about one fourth part. The capacity of a single stamp is to crush about two tons an hour of the Lake Superior trap rock which contains copper, running about 100 strokes per minute. It is supplied with pieces as large as a common brick, and they are reduced to fine sand.—A machine known as Blake's stone breaker has been patented in the United States for similar use, and has been employed in the Central park in New York for crushing stones into small fragments for road making. It is an arrangement for breaking hard substances between iron jaws, and is worked by a belt from a steam engine which passes over a pulley attached to a shaft carrying two heavy fly-wheels. The machine is supported upon a very solid iron frame cast in one piece. Its length is 7 feet 8 inches, width 4½ feet, and weight about 8,100 lbs., the heaviest single piece about 3,400 lbs. At the end of the machine opposite the pulley shaft are the two jaws between which the stones are crushed. The outer one, firmly fixed in the solid block of iron, presents a ribbed vertical face to the opposite movable jaw, which is suspended upon an iron axis that passes through its upper end. This end is several inches higher than the other jaw, its point of suspension being above the general surface of the iron block. It slopes toward the fixed jaw, the distance apart at the top being 5 inches, and diminishing at the bottom to any desired space, according to the fineness of the product required. Upon the pulley shaft is a short crank from which a vertical pitman of great strength connects below with the long arm of a powerful lever, the fulcrum of which is at the opposite extremity. Near this extremity stands upon the lever an upright piece connecting at its upper end with two toggles, which as they are straightened by raising the lever push the lower part of the movable jaw toward the other about $\frac{1}{2}$ of an inch. As the stones thrown in between the jaws wedge themselves down in the triangular space, this slight movement is sufficient to crush them, so that as the jaws move back they fall a little lower, and with the next bite they are again reduced in size, till at last they drop through the space that divides the bottom of the jaws. The operation is very effectual for reducing stones of any hardness to small fragments, and in metallurgy is applied

with great advantage to crushing iron ores and rich ores of other metals which do not require very thorough pulverization and washing to prepare them for the furnace.—The ores, being crushed, may be next riddled or sifted, which is conveniently done in revolving cylindrical screens set upon an inclined axis. Both ends of the screen are open, the upper receiving the stuff, it may be by its sliding directly down from a pair of crushing rolls, and the lower discharging the coarser portions which cannot pass through the meshes. In this case the coarse ore is generally taken as it leaves the screen in the buckets of a large revolving wheel, by which it is carried up and delivered again into the hopper which supplies the crushing rolls. The fine ore is received in wagons from the slides under the screens, and is then taken to the dressing floors. There it is subjected to a variety of operations, commencing usually with that termed "jigging." This consists essentially in sifting the fine ore in a tub through which runs a current of water, and was formerly done with hand sieves, which when nearly filled were thrust suddenly under the water and whirled partly round and back. The effect of this is to cause the heavier portions to sink below the lighter, and the different matters to arrange themselves in layers according to their specific gravities. The fine, light, muddy stratum which gathers at the top is scraped off, more ore is added, and the process is repeated. When the sieve gets nearly full of washed ore, it is emptied upon the pile. The fine particles of ore which pass through the sieve fall to the bottom of the tub, and are occasionally collected, the water being drained off for the purpose. When worked by machinery, the jigging sieves are much larger, and the tubs are cisterns, usually about 6 feet long, 4 broad, and 4 deep. A large number of them are set in a line in front of a revolving shaft furnished with a short crank for each jigger. This crank, by means of levers connecting with the rod by which the sieve is suspended, communicates to it a joggling motion up and down. By means of another lever, with a chain suspended from it within convenient reach, the workman can at any time raise the sieve out of the water. The current of water which flows through the cistern carries off a portion of the fine ore; to recover this it may be conveyed into a succession of pits in which the heavy ore can settle to the bottom, or the machine called a buddle, of which the latest and most approved form is the circular buddle, may be used. Along the troughs leading to this are placed small revolving cylinders for agitating the sediments, and these then flow through a revolving screen or riddle which turns away from the buddle any coarse particles that will not go through its meshes. The buddle consists of a circular pit 18 to 24 feet in diameter, and 2 or 3 feet deep around the edges and some 8 or 10 inches less in the centre. At this point there stands a conical post, upon the top of which a hopper is made to revolve and

carry around with it two arms, which together reach nearly across the pit. To each of these arms a board is suspended by pulleys and counterpoising weights, so that its lower edge, which is armed all along with small brushes, sweeps around, just touching the sediments which accumulate upon the sloping floor. The current is discharged from a trough directly into the central hopper, and flowing down the conical post spreads equally in every direction. The brushes aid to keep the lighter particles in suspension, and these gradually make their way toward the outer edges, while the heavy particles collect near the centre. The water carries off the worthless slime and mud, and when the buddle is cleaned out the outer portions of the deposit may often be thrown away, while the heavy central parts are saved as rich ore. The middle portions may be passed again through the agitator and buddle.—Descriptions of the processes of reducing or smelting the prepared ores, which is the most important branch of metallurgy, will be found under the accounts of the separate metals, as already mentioned. It was intended to have presented here further particulars respecting some late methods of producing malleable iron direct from the ore; but the success of these operations up to the present time (Oct. 1860) has been too limited to justify much addition to what has been stated in the article IRON MANUFACTURE. The process patented by Mr. James Renton of New Jersey, and put in operation at Newark, has been considered by many persons one of the most promising of these attempts. A set of vertical fire brick flues, 5 by 18 inches in area and 12 feet high, were placed in an oven 16 feet high and 18 feet square, over a furnace for balling the iron with which the lower ends of the flues connected. The ore, pulverized and well cleaned, is mixed with $\frac{1}{4}$ its weight of fine charcoal and introduced into the flues from above. These, left open at top for the escape of the gases, are heated by the ascent of the products of combustion from the furnace below. The ores are deoxidized, and after being exposed to a red heat for about 18 hours are let down into the furnace, where the ore worked into a ball is immediately taken to the hammer or squeezer. With rich magnetic ore well prepared the product of iron to the furnace is about 2 tons in 24 hours. In other processes designed to effect the same end, the ore mixed with coal has been spread upon shelves over which the flames from a lower furnace passed as they were carried forward to the chimney. They were thus deoxidized, and as the process went on successively pushed down from one shelf to another, till they reached at last the furnace in which they were worked up into a ball.

METAPHOR (Gr. *μεταφερω*, to transfer), in rhetoric, a species of trope by which a word is used to designate something which it only resembles. Thus, the sentence: "He is a lamb in peace, but a lion in war," is an abridged form for the full comparisons: "He is like a lamb in

peace, but like a lion in war." Nearly all metaphysical terms are metaphorical, their application being transferred from physical to spiritual phenomena; and a large proportion of the words in common use are employed in a metaphorical sense.

METAPHYSICS. See **PHILOSOPHY.**

METASTASIO, PIETRO ANTONIO DOMENICO BONAVENTURA, an Italian poet, born in Rome, Jan. 3, 1698, died in Vienna, April 12, 1782. His father had removed from Assisi to Rome, and although reduced in circumstances and successively a soldier, an amanuensis, and a pastry cook, he was enabled to place his son at a grammar school. Pietro's taste for poetry was powerfully stimulated by the reading of the works of Tasso, and he is said to have excelled in improvising verses at the age of 10. Gravina, an eminent jurist and scholar, greatly impressed by his talents, adopted him as a son, changing his name of Trapassi to that of Metastasio (from the Gr. *μεταστας*, change or transfer), and preparing him for the profession of the law, but without discouraging his studies in classical and dramatic literature, in which he advanced so rapidly that at 14 he wrote a tragedy, *Giustino*, after the model of the Greeks. He accompanied his patron to Naples, where his remarkable powers of versification and elocution, and the charm of his manners and conversation, gained him many friends. He continued to study jurisprudence, and also took holy orders, whence he was sometimes called Abbate. Gravina bequeathed him on his death in 1717 a considerable fortune; but the prodigal young poet squandered most of it within 2 years, and for a short time again applied himself to the study of the law. Soon returning to his favorite pursuit, he produced an epithalamium and the drama *Endimione*. Under the patronage of the viceroy of Naples he wrote *Gli orti esmeraldi* and *Angelica*, the latter after Ariosto. The part of Venus in the former play was performed by Maria Bulgarini, or La Romanina, who was at that time the leading Neapolitan prima donna, and whose appreciation of Metastasio's genius laid the foundation of a most intimate relation, the poet taking up his residence in her husband's house, and writing under her inspiration his *Didone abbandonata* (1724), which was set to music by Sardi and other composers, and established Metastasio's fame. He accompanied the signora to Rome, where his *Semiramide* (set to music by Meyerbeer in 1819), *Ezio*, *Alessandro nell' India*, *Catone in Utica*, and *Artaserse* (the last well known in an English version) were performed in rapid succession. In 1729 he went to Vienna, where he succeeded and soon surpassed Zeno as imperial laureate, and occupied himself in supplying the court with lyrical dramas and oratorios, composing miscellaneous poetry, and teaching music and Italian to the Austrian princesses. In 1738 appeared his *Olimpiade*, which was honored with the epithet "divine" by his enthusiastic countrymen; and one of his most celebrated lyrical dramas, *La clemenza di*

Tito, was performed in 1734, and was again set to music, with great success, in 1790 by Mozart. The death of the emperor Charles VI. in 1740, and the outbreak of war, led to the closing of the theatre in which he had been employed, and he now devoted himself to literary pursuits, chiefly to translations and annotations of Greek writers. In 1744 appeared his plays of *Antigone* and *Ipermestra*. After the return of peace (1751) he wrote *Il re pastore*, which was enacted by the ladies of the imperial family. His last operatic play, *Il ruggiero*, was produced at Milan on occasion of the marriage of the archduke Ferdinand (1771). La Romanina had bequeathed to him on her death in 1734 the reversion of a considerable amount of property, but Metastasio restored to her husband the right of disposing of it; yet, notwithstanding a generosity which bordered upon recklessness, he amassed in the latter part of his life a large fortune, which he bequeathed to the children and chiefly to the son of his friend Martinetz, whose hospitality he had enjoyed when he first went to Vienna. His last occupation was the superintendence of the magnificent Paris edition of his works. Metastasio was beloved as much for his amiable character as for his genius. He was as gentle in his life as in his writings, and young aspirants to fame had no more devoted friend than the venerable poet, who was among the first to recognize the genius of Mozart, and to express his admiration of a comic opera which the youthful composer, then only 12 years old, had set to music in 1768 at the request of the emperor Joseph. Metastasio was a devout Christian, and Pope Pius VI., happening to be in Vienna at the time when he was taken ill, hastened to his deathbed and gave him his benediction. He was buried in the church of St. Michael, and in 1788 his bust was placed by Cardinal Riminaldi in the church of St. Mary at Rome.—Schlegel says: "A perfect purity of diction, a grave and unalloyed delicacy have rendered Metastasio, in the eyes of his countrymen, a classic author, the Racine of Italy. In the softness, tenderness, chasteness, and gentle pathos of his verse, he is not surpassed by any other poet of the musical drama; and although deficient in the genius of impassioned tragedy, he is unrivalled in his operatic plays." Although his dramas were set to music as soon as they were written, not a vestige of the original music now remains, except perhaps in the imperial library at Vienna. His best known oratorios are *La morte d'Abel*, *Isacco*, and *La passione*; and his most popular cantatas are *La liberta*, *La primavera*, and *La partenza*. A *catalogue raisonné* of his compositions is given by Dr. Burney. The best editions of his works are those in 12 vols. (Paris, 1780-'82), and 20 vols. (Mantua, 1816-'20).—See Burney, "Memoirs of the Abbate Metastasio," with translations of his principal letters (8 vols. 8vo., London, 1796). The best Italian sketch of his literary career is by Mauro Boni in his edition of Metastasio's works (Padua, 1811).

METASTASIS (Gr., from μεταστροφή, to trans-fer), in medicine, the sudden transference of diseased action or of a secretion natural or morbid from one part of the body to another. In the old days of the humoral pathology it was supposed that disease was always caused by some alterations of the fluids, while its local manifestations were often produced by an effort at elimination by the part affected; that, if immediately on the retrocession of measles the patient was attacked with pneumonia, the peccant humor was transferred from the lungs to the skin; that in rheumatism and gout the joints were left and the heart attacked; that hæmorrhage from the lungs occurred as a consequence of suppressed menstruation; and that milk leg had its origin in the transference of that secretion from its normal position to the affected limb. Larger observation and clearer insight have shown the facts to be wrongly interpreted and the theory false. In rheumatism the lining membrane of the heart and the pericardium form portions of a series of analogous tissues which are liable to be attacked, and these tissues are attacked at one or several points, irrespective of any transference of morbid action from one point to another. So when an internal organ is seized with inflammation, an eruption on the skin is apt to fade, this fading being a consequence, not a cause, of the inflammation. Milk leg (*phlegmasia alba dolens*), it is discovered, is caused by inflammation of the veins, and has nothing to do with the retrocession of the milk. When a discharge of blood takes place from the surface of an ulcer or some other abnormal position in cases of suppressed menstruation, it must be regarded as an effort to relieve a periodic plethora. These cases, however, are found to be extremely rare, the part which they play in the old books giving an entirely erroneous idea of their frequency.

METCALFE, CHARLES THEOPHILUS, baron, an English statesman, born in Calcutta, Jan. 30, 1785, died at Basingstoke, England, Sept. 5, 1846. He was the second son of Major Thomas Theophilus Metcalfe of the Bengal army, who was made a baronet in 1802. Charles, while yet an infant, was taken to England by his parents, was educated at Eton, and at the age of 15 was sent to India as a writer in the East India company's service. In Dec. 1801, he was appointed assistant to the English resident at the court of Dowlut Row Sindia at Oojein. He soon displayed great diplomatic talent, and rose rapidly in the civil service of the company. In 1811 he was appointed to the important post of resident at Delhi; in 1819 he became political secretary at Calcutta, and in the following year resident at Hyderabad. On the death of his elder brother in 1823, he succeeded to the baronetcy, and 4 years afterward was made a member of the supreme council of India, the highest post beneath that of governor-general. In 1836 the grand cross of the bath was conferred upon him, and he was appointed lieutenant-governor of the North-Western provinces; in Aug. 1837, he resigned and returned

to England. He remained in retirement till June, 1839, when he was solicited by the ministry to accept the government of Jamaica, that colony being then convulsed by the difficulties attendant upon the transition of the negroes from slavery to freedom. He accepted the post, and in the course of 8 years completely restored order and contentment in the island. Ill health compelled him in 1842 to resign and return to England. The legislature of the colony, grateful for his services, subsequently ordered his statue to be erected in the public square of Spanish Town. Early in 1848 the ministry again had recourse to his great administrative talent, and persuaded him to accept the governor-generalship of Canada. He held this responsible and difficult position, to the satisfaction of all parties, till the latter part of 1845, when, after enduring terrible suffering from an incurable cancer which had long afflicted him, he resigned his office and returned to England to die. He had been raised to the peerage in 1844. His epitaph, written by Macanlay, terms him "a statesman tried in many high offices and difficult conjunctures, and found equal to all," and says that "costly monuments in Asiatic and American cities attest the gratitude of the nations which he ruled."—See "The Life and Correspondence of Charles, Lord Metcalfe," by John William Kaye (new ed., 2 vols., London, 1858).

METCALFE, THOMAS, an American statesman, born in Fauquier co., Va., March 20, 1780, died in Nicholas co., Ky., Aug. 13, 1855. When he was a child his parents removed to Kentucky, and settled in Fayette co. After a few months' attendance at a country school he was apprenticed to a stone mason, and worked assiduously at his trade, but devoted his leisure hours to books. In 1809, when the relations of the United States with England assumed a threatening character, he publicly advocated war, and was afterward chosen a captain of infantry, and distinguished himself in the north-western campaign under General Harrison, especially at the siege and battle of Fort Meigs. Returning to Kentucky after the war was over, he was elected to the legislature, where he served 4 or 5 years. In 1819 he was elected to congress, and served by successive re-elections till 1828, when he became a candidate for the office of governor of Kentucky. After an exciting canvass he was elected by a decisive majority, and held the office for 4 years. In 1834 he was elected a member of the state senate, and in 1840 became president of the board of internal improvements. This office he held until June, 1846, when he received from the governor of the state the appointment of U. S. senator, to fill a vacancy occasioned by the resignation of J. J. Crittenden; and on the meeting of the legislature he was elected for the residue of the term, which expired March 3, 1849. He then retired to his farm in Nicholas co., and never afterward sought office. In politics Gov. Metcalfe was a conservative whig.

METELLUS, a plebeian family of the *Oscilia gens*, numerous members of which were conspicuous in the later periods of the Roman republic. The following are the most distinguished. I. **Lucius Osciilius Metellus**, commanded against the Carthaginians in the first Punic war, defeated Hasdrubal in 250 B. C., and was honored with a triumph; was twice consul, once dictator for the purpose of holding the comitia, and pontifex maximus during the last 22 years of his life; lost his sight while rescuing the Palladium from fire, and died about 220 B. C. II. **Quintus Osciilius Metellus**, son of the preceding, served successively as plebeian ædile, curule ædile, consul, proconsul, and dictator for the purpose of holding the comitia; fought in the second Punic war against Hasdrubal in Spain, and against Hannibal in Bruttium, and survived the final victory over the Carthaginians many years. III. **Quintus Osciilius Metellus**, surnamed **Macedonicus**, son of the preceding, commanded as prætor in Macedonia, where he defeated and made prisoner the usurper Andrisicus (148), fought successfully against the Achæans (146), and as consul against the Celtiberians in Spain. He was censor in 131, and died in 115 after a long career of honors and private happiness, and was carried to the funeral pile by 8 sons who had officiated as consuls, and a 4th who was candidate for the same dignity. The 1st, 2d, and 4th were afterward distinguished by the surnames of *Balearicus* (from the conquest of the Balearic isles), *Diadematus*, and *Caprarius*. IV. **Lucius Osciilius Metellus Dalmaticus**, nephew of the preceding, officiated as consul, censor, and pontifex maximus, received his surname from his victories over the Dalmatians in 119 B. C., and was active against the demagogue Saturninus 19 years later. V. **Quintus Osciilius Metellus Numidicus**, brother of the preceding, was distinguished alike by his great integrity and rare abilities in peace and war. He commanded as consul in 109, and as proconsul in the following year, against Jugurtha in Numidia, but had the mortification to see the fruit of his victories, the honor of a final triumph over the enemy, snatched from his hands by Marius, his legate, who supplanted him in the opinion of the Roman people by artful calumnious rumors, and was elected consul to succeed him in command. He was, however, allowed a triumphal entry into Rome (107), and subsequently elected censor (102). Two years later Marius, now the idol of the *plebs*, concerted with the tribune Saturninus a scheme to destroy the influence of Metellus, who was regarded as the foremost leader of the aristocratic party. Saturninus moved and carried through an agrarian law, with an additional enactment requiring the senators to take an oath of fidelity to the same, under penalty of being expelled the senate. Metellus remained faithful to his convictions, suffering with calm resignation not only expulsion from the senate, but subsequently also the heavier blow of banishment from Rome.

He retired to Rhodes, whence he was recalled in the following year, on the proposition of the tribune Quintus Calpurnius. Metellus was no less renowned for his oratorical powers than for his civic virtues. His orations are praised by Cicero, and were still admired in the time of the Antonines. VI. **Quintus Osciilius Metellus Pius**, son of the preceding, received his surname from his filial efforts to bring about the recall of his father from exile. He commanded in the social war, tried in vain to save Rome from Marius and Cinna in 87, crossed over to Africa, and subsequently fought with distinction against the Marian party in Umbria, Cisalpine Gaul, and Spain, where his efforts proved insufficient against Sertorius. He was consul with Sylla in 80, and died while pontifex maximus, being succeeded by Julius Cæsar (68). VII. **Quintus Osciilius Metellus Celer**, great-grandson of Metellus Macedonicus, served as legate under Pompey in Asia, and as prætor in Italy in the year of Cicero's consulship (68), with whom he actively coöperated against Catiline and his followers. On the outbreak of the war, being intrusted with the command in Picenum and the Senonian district in upper Italy, he greatly contributed to the defeat of Catiline by blocking up the passes of the Apennines, and thus compelling him to face the army of Antonius, Cicero's colleague. In 62 he was sent as proconsul to Cisalpine Gaul, in 60 officiated as consul with Afranius (opposing the schemes of Pompey, who was better served by his colleague as well as by his younger brother Nepos), and died in the following year, it was suspected from poisons administered him by his profligate wife Clodia. VIII. **Quintus Osciilius Metellus Pius Scipio**, the adopted son of Metellus Pius. (See *Scipio*.) IX. **Quintus Osciilius Metellus Creticus**, received his surname from the conquest of Crete, whither he was sent as consul in 69, and whence he returned in 66, but was prevented by his political opponents, the friends of Pompey, from celebrating a triumph till after the defeat of Catiline, during whose agitation he had prevented an insurrection of the slaves in Apulia.

METEMPSYCHOSIS (Gr. *μετα*, denoting change, and *ψυχη*, soul), the supposed transmigration of the soul from one body to another. The idea belongs to the oldest religions of India and Egypt, and is one of the earliest forms in which the doctrine of immortality appears. It regards human life on the earth as only one link in a chain of conditions, through which the soul passes in its long career of procession from God and return to him. It is a prominent feature in the systems of Brahminism and Buddhism, which represent the migration after death into the body of a higher or lower animal as a reward of virtue or penalty for vice. The soul may even deteriorate into the vegetable or mineral world. It accomplishes 88 transmigrations before it rises to human consciousness, reason, and freedom, and is then liable to be returned to begin the series again. A period of

12,000 divine years, each embracing 360 human years, is assigned for the completion of its transformations and for the process of purification, when it ultimately receives its reward in what is described as a state of blissful absorption in the divine nature. According to Herodotus, the Egyptians were the first to entertain this doctrine. They believed that the soul was clothed successively with the forms of all the animals that live on the earth, and that it then returned after a cycle of 3,000 years into the body of a man, to recommence its eternal pilgrimage. From them the Greeks may have received the idea, which was a leading feature of the Pythagorean philosophy. The later Pythagoreans maintained that the soul has a life peculiar to itself, which it enjoyed in common with demons or spirits before its descent to the earth, and that there must be a degree of harmony between the faculties of the soul and the form which it assumes. After freeing itself from the fetters of the body, and remaining for a time in the realm of spirit, it returns to the earth to accomplish again the process of purification through a series of animals and human bodies. Plato adopts and treats the doctrine in his *Phædo*, maintaining the preexistence of the soul before it appears in man, of which condition it retains dim reminiscences; and after death, according to its peculiar qualities, it seeks and chooses another body. Every soul, according to him, returns to its original source in 10,000 years. After completing each life it spends 1,000 years in the infernal world in a condition corresponding to that life, after which it passes into a new body corresponding to its ethical quality. The idea of metempsychosis subsequently appears in the speculations of the Neo-Platonists, in the cabala of the Jews, and in the teachings of one of the church fathers. Porphyry gave to it its most definite development in Neo-Platonic thought. He conceives that it is to expiate sins committed in a pre-existent state that we are now clothed with a body, and that as our conduct was more or less culpable we assume more or less material bodies. By fulfilling exactly and with resignation the duties imposed upon us, we return by degrees through the state of heroes, angels, archangels, &c., to the Supreme Being. There is also a descending scale of diabolical life. The cabalists thought that the destiny of every soul was to return into mystical union with the divine substance, but that in order to do this it must first develop all the perfections of which it has the germ within itself. It is sent through life after life till it acquires all the virtues possible to it. According to some cabalists, God created a definite number of Jewish souls, which, though sometimes transferred for penance to the forms of animals, are ever reappearing among men, and constituting the Jewish race; and that on the morn of the resurrection they will all dwell in the bodies of the just in the Holy Land. Origen distinctly maintains the doctrine, and finds in it the final cause of creation. In his view, God gave

existence to the world, not to manifest his power or any other of his attributes, but as a place of chastisement for those souls which had sinned in heaven; and this design explains why the Deity introduced so many apparent imperfections into his work. The idea appears in the tenets of the Gnostics and Manichæans, and of some other heretical sects. It was also a part of the doctrine of the druids, and is still believed by the Druses and various other tribes in western Asia and in Africa. Fourier attempted to revive it in a new form. According to him, it is the destiny of the soul to pass through 810 lives, embracing altogether a period of 81,000 years, 27,000 of which will be spent on this planet. When all the transmigrations have been accomplished, every soul will lose its separate existence, and all will become confounded with the soul of the planet, the stars being animated like men. The body of our planet will in its turn be destroyed, and its soul will pass into a new globe, and rise through an infinite number of successive transformations to the highest degrees in the hierarchy of worlds.

METEOR (Gr. *μετεωρος*, lofty, in the air), any phenomenon of short duration occurring in the atmosphere. Rain, snow, hail, fog, and dew are meteors distinguished as aqueous; the movements of the winds constitute the varieties of aerial meteors; luminous meteors are the singular phenomena displayed by the action of the aqueous particles diffused through the atmosphere upon the rays of light, such as *fata Morgana*, halo, mirage, rainbow, &c., and may also include the aurora borealis; and igneous meteors are such phenomena as lightning, *aérolites*, shooting stars, &c. Most of these are described in this work under their own names.—In common language, the term meteor is applied only to those bodies which, as globes of fire or as shooting stars, are occasionally seen darting through the heavens at unknown distances from the earth, and in undetermined paths. Sometimes exploding and projecting upon the earth fragments of stone called meteoric iron, they are proved to be solid bodies in a state of intense heat, and are then known as *aérolites* or *meteorolites*. In ancient times these bodies were witnessed in different parts of the earth, and their appearance was chronicled as among the most wonderful natural exhibitions. The Chinese records of such phenomena extend back to 644 B. C.; and from the 7th century B. C. to A. D. 383, 16 falls of *aérolites* are recorded in the astronomical annals of the Chinese. By the Greeks and Romans in the same period accounts are preserved of only 4 such falls. Humboldt states that it is remarkable that the Ionian school, in accordance with the present opinion, early assumed the cosmical origin of meteoric stones. Anaxagoras of Clazomenæ held that the meteors are masses torn away from the earth by the violence of the rotation; and that between the earth and the moon there revolve other dark bodies, which can produce eclipses of the moon. Di-

ogenes of Apollonia, as recorded by Stobæus, also taught that dark masses of stone move with the visible stars and remain unseen by us. Plutarch in the life of Lysander (cap. xii.) expressly declares that falling stars "are really heavenly bodies, which from some relaxation of the rapidity of their motion, or by some irregular concussion, are loosened and fall, not so much upon the habitable part of the globe as into the ocean, which is the reason that their substance is seldom seen." Considerations like these suggested by the fall of cosmical bodies to the earth thus led in Grecian antiquity to the perception of a centrifugal revolution of the heavenly bodies, and, as a necessity, of a centripetal force also, holding the bodies in their orbits, which is distinctly alluded to by Simplicius, the commentator on Aristotle, who describes it as a "fall force" or "drawing downward."—The nature and movements of the meteoric bodies which fall upon the earth have already been considered under *ÆROLITE*. But some of the most extraordinary meteoric displays, of the nature of fire balls or bolides, and of shooting stars, not being accompanied by falls of stone, may properly be noticed in this place. The bolis is the fiery body from which *ærolites* are precipitated upon the earth; but many such bodies pass across the heavens, and sometimes explode and disappear, leaving behind no vestiges of their solid materials. They appear singly at irregular periods, and move with great rapidity across the sky, exhibiting sometimes a dazzling brilliancy, greater than that of the sun at noonday, as is remarked by Humboldt of one seen at Popayan in 1788. A luminous train follows them, and their path has been known to remain brilliant for several minutes after they have disappeared. Admiral Krusenstern, indeed, in his "Voyage," describes a fire ball the train of which shone for an hour after the body had disappeared, scarcely moving during this time. They send forth vivid scintillations and present various bright colors, and the same meteor is differently described as seen from different places. Often they divide into two or more bodies which keep along together, and sometimes explode with a report like heavy thunder. They are of various apparent sizes, sometimes exceeding that of the moon. Their altitude varies as they approach the earth, and again move away from it as they continue on their course. On Feb. 6, 1818, one was seen in England at about 2 P. M. descending vertically and shining with a light equal to that of the sun. Dr. E. D. Clarke, who described this in the "Annals of Philosophy," vol. xi. p. 278, was of opinion that meteorolites fell from this body; and in Lincolnshire it was reported that a hissing noise accompanied it, and a trembling of the earth was felt like the shock of an earthquake. The records of fire balls seen in the evening are very numerous. They appear at no particular season, and are limited to no particular portions of the earth, though most of the observations have been recorded in Europe. In 1628

one was seen over Germany, and described by Kepler. In 1676 one passed over Italy from the direction of Dalmatia about 2 hours after sunset, and disappeared toward Corsica. At Leghorn it was heard to explode, and fragments from it fell into the sea. Its height was estimated by Montanari at 88 m. Halley describes in the "Philosophical Transactions," No. 360, a meteor of extraordinary brilliancy which appeared over England in 1719 at about 8½ P. M. It suddenly illuminated the streets of London, causing the stars to disappear, and the moon, which before was shining brightly, to be hardly visible. The eye directed toward it could scarcely bear its brilliancy. It moved like a falling star at a height estimated at 60 to 70 m., and with a velocity of 300 to 350 m. in a minute; through Devon and Cornwall and on the opposite coast of Brittany a loud explosion was heard proceeding from it. On Aug. 18, 1788, at 9 P. M., another very remarkable meteor of this character was seen over a large part of Europe from the N. of Ireland to Rome. It crossed the zenith at Edinburgh, appearing single and well defined, of a greenish shade, and with a tail; but at Greenwich it had the appearance of two bright balls with other luminous bodies following it. Its height was estimated to be above the limits of the atmosphere, its speed more than 1,000 m. a minute, and its diameter more than a mile. Cavallo describes its bursting and the noise of the explosion, which was 10 minutes in reaching the earth. Bowditch describes, in the "Memoirs of the American Academy," a meteor seen Nov. 21, 1819, at Danvers, Mass., and in Baltimore, Md., the diameter of which appeared to be half a mile. Its direction was S. 44° W., and its height, at first 38 m., was soon reduced to 22 m. Two minutes after its disappearance a rumbling noise was heard which lasted longer than a minute. On the evening of July 20, 1860, at about a quarter before 10 o'clock, a meteor passed over the state of New York, from the west, being seen on Lake Erie, and soon afterward at Buffalo, Albany, New York city, New Haven, Newport, R. I., and New Bedford, Mass. At the south it was visible in the state of Delaware. By many observers it was at first supposed to be a display of rockets or of Roman candles; and all had the impression that its elevation was only a few hundred feet. From a vessel off Sandy Hook it appeared to fall into the sea at a short distance. First appearing as a single body, it was observed to separate into two balls, which kept along together, emitting sparks and what appeared to be flames. Whether these bodies move in eccentric orbits around the sun or around the earth is undetermined, and no explanation yet satisfactorily accounts for their ignition in the upper regions of the atmosphere, where this fluid through its extreme rarity can offer but very slight impediment to their motion.—Falling stars resembling small bolides are often seen on a clear night shooting at the rate of 4 or 5 an hour across the sky. These are termed

"sporadic" meteors, in contradistinction to the "periodic," which at certain periods appear often in vast numbers like showers of fire. Displays of this kind are recorded as occurring in Oct. 902; Oct. 19, 1202; and Oct. 21, 1866 (O. S.). Each time the stars are stated to have been in motion all night, falling like locusts, and in numbers which no one could count. More modern occurrences of this phenomenon were observed on the night of Nov. 9-10, 1787, in southern Germany; and after midnight of Nov. 12-13, 1799, as described by Humboldt and Bonpland, in Cumana. The same phenomenon was also observed as far south as the equator, and over North America, even to Labrador and Greenland, and on the other side of the Atlantic in Germany. From the bearing and course of the meteors at different points, their elevation was computed to be 1,419 m. In 1818 meteoric displays of great brilliancy were seen on the same night of Nov. 12-13, in England, and again in 1822 at Potsdam in Brandenburg. In some of the exhibitions about this period a deposit of dust was observed upon the surface of the water, on the buildings, and other objects. On the same night in 1831 and in 1832, the same phenomenon reappeared in Europe and America. But the year 1833 is memorable for the most magnificent display on record. This was on the same night of November also, and was visible over all the United States, and over a part of Mexico and the West India islands. Together with the smaller shooting stars, which fell like snow flakes and produced phosphorescent lines along their course, there were intermingled large fire balls, which darted forth at intervals, describing in a few seconds an arc of 80° or 40°. These left behind luminous trains, which remained in view several minutes, and sometimes half an hour or more. One of them seen in North Carolina appeared of larger size and greater brilliancy than the moon. Some of the luminous bodies were of irregular form, and remained stationary for a considerable time, emitting streams of light. At Niagara the exhibition was especially brilliant, and no spectacle so terribly grand and sublime was ever before beheld by man as that of the firmament descending in fiery torrents over the dark and roaring cataract. It was observed that the lines of all the meteors if traced back converged in one quarter of the heavens, which was γ Leonis Majoris; and this point accompanied the stars in their apparent motion westward instead of moving with the earth toward the east. The source whence the meteors came was thus shown to be independent of the earth's rotation and exterior to our atmosphere. As computed by Prof. Denison Olmsted of New Haven, it could not have been less than 2,238 m. from the earth. Three successive annual returns of this phenomenon on the same night led astronomers on both sides of the Atlantic in the following years to watch for its recurrence; and displays more or less brilliant, but not by any means equal to that of 1833,

were witnessed in different places in Europe or America every year till and including 1839. They were again observed on the night of Nov. 12-13, 1841 and 1846. Olbers, the astronomer, supposes the real period of return to be 84 years, and that the display of 1799, repeated in 1833, will reappear in 1867. But it is not alone in November that periodic exhibitions of the fall of meteors have been observed. It is found that they often occur about the 10th, or from the 9th to the 14th of August; and Humboldt names other periods that are likely to prove of the same interest, as about the 22d to the 25th of April; between the 6th and 12th of December; the 27th and 29th of November; and about the 17th of July. He notices the singular coincidence which different observers have remarked in the great brilliancy of the aurora borealis during the fall of the meteors. As explained by Prof. Olmsted, the meteors probably emanate from a nebulous body, which revolves around the sun in an elliptical orbit, the aphe- lion of which meets the orbit of the earth at the times of the annual exhibitions. The nebular character is inferred from the fact that none of the meteors, though they fall toward the earth with prodigious velocity, ever reach it in a solid state, all being dissipated in the atmosphere, and no material substance found to indicate their nature. The theory of Arago is similar to that of Olmsted. He suggests that the meteoric bodies may constitute a stream in the form of an annular zone, within which they pursue one common orbit; that there are several such streams, which intersect, each at its own period, the earth's orbit; and that through each the myriads of small cosmical bodies are irregularly dispersed. It is in passing the densest groups of these that the most brilliant meteoric displays occur. The subject is treated at length in the 1st and 4th vols. of Humboldt's "Cosmos."

METEOROLOGY (Gr. *μετεωρος*, lofty, above the earth, and *λογος*, discourse), the description and explanation of the various changes which occur in the region of our atmosphere. These changes are apparently so capricious that at first sight they would seem to be governed by no law; yet, although we are not able to predict the recurrence of the phenomena, much has been done toward referring them to the general principles on which they depend. In this place we purpose to give a brief exposition of these principles, referring to the several articles on ATMOSPHERE, CLIMATE, CLOUDS, DEW, and the like, for a more particular account of the phenomena themselves. In order to convey the greatest amount of knowledge in a definite form and the least number of words, we shall adopt the synthetical method, and endeavor to show, by the combination of known laws, the general phenomena which would be presented by a body like our earth situated in mid space, composed of known materials, and subjected to definite influences.—The earth is a spherical body, slightly flattened, isolated in space, turning uniformly around an ideal axis which pierces it

surface in two points or poles, while it describes a curve slightly elliptical round the sun once in a year. It is surrounded with an atmosphere of such extreme mobility that the lightest force produces changes in it of a meteorological character, and hence the variety and complexity of this class of phenomena. The earth at present does not appear to possess any power of producing, except in a small degree, spontaneous changes in its surface which could affect its meteorology. Geologists teach that the temperature of the interior of the globe is still higher than the melting point of the most refractory metals, and that this original heat of the earth in past geological ages has been active in transforming the crust of the globe; yet it is conclusively shown from other considerations, that at present the cooling is so far advanced that the internal heat does not perceptibly affect the temperature of the external surface. We are therefore to look for the motive power of nearly all the changes going on around us to forces from without; and in considering these we shall begin with radiation from the stars.—It is well known that at one time the stars were supposed to control human destiny; and although modern science has discarded most of the pretensions of astrology, yet in this instance it has shown that the stars have really a physical influence upon the earth. If from any point a line be extended in thought in any direction, it will ultimately reach a radiating body; and hence every point within the stellar universe must be constantly traversed in all directions with radiating impulses, which must impart to a body in space a given temperature. If the radiation then from the stars continue invariable, what is called the temperature of celestial space will be without change. According to the dynamic theory of heat, if there were no stellar radiation, and an absolute cessation of the vibrations which constitute this principle, the expansion of all bodies would cease at a temperature of about 500° below that of freezing water. According to the experiments of Pouillet, made with an artificial sky, the heat of celestial space is 254° below the freezing point of water, and consequently about 246° above the absolute zero of temperature. From this it is evident that our globe actually receives an immense amount of heat from the stars, which is invariable in quantity, and nearly of equal intensity on every part of the earth's surface. The temperature is still further increased by the accumulating property of the atmosphere, which transmits to the earth the heat of high intensity of the stars, and confines the dark heat which alone radiates from the earth. In this way, according to Pouillet, the temperature of the surface of the earth is elevated 94° above that of celestial space. It is still 160° below that of freezing water, and far below the point at which life can exist on the globe. The heat therefore which produces motion on the surface of the earth, and is alone compatible with animal and vegetable vitality, is that from the sun. If the earth

revolved round this luminary on an axis perpendicular to the plane of its orbit, there would be no variations of seasons, and throughout the year every part of the earth would experience nearly a uniform temperature, decreasing in intensity as the cosine of the latitude each way from the equator to the poles. But from the simple fact that this axis inclines about 23° from the perpendicular, the two poles are alternately turned to and from the sun, and hence result the complex and varied changes of spring, summer, autumn, and winter. A small variation is also produced in the temperature on account of the elliptical form of the earth's orbit. The earth must actually receive during 24 hours, when it is nearest the sun, a greater amount of heat than during the same time when it is at its greatest distance from it. Thus in the present century the earth is nearest the sun on the 1st day of January, and consequently receives on that day the greatest amount of heat; and is furthest from the sun on the 4th day of July, and on that day receives a less amount of light and heat than on any other day of the year. (See Meech, "Smithsonian Contributions to Knowledge," vol. ix. 1857.) Sir John Herschel, however, has shown that although there is a greater amount of heat received during a day in the one position than in the other, yet the whole amount received in the course of a year will be the same as if the earth revolved in a perfect circle of which the sun occupied the centre, since the rapidity of motion in the different parts of the orbit will be inversely as the quantity of heat received; or in other words, the greater length of time to which the earth is subjected to a less heat just compensates the greater heat in less time. But in this calculation, the effect of cooling has been left out of view; the earth is not only receiving heat at every moment, but is constantly radiating it into space. When the amount given off is just equal to that received, it is as a whole in a state of equilibrium with regard to heat; but when the amount given off is greater than that received, then, although the radiation or cooling from the earth as a whole is very nearly the same as it would be if the earth revolved round the sun in a circle, yet the temperature of the southern portion of the earth must be less, other things being the same, than that of the northern, on account of its longer winter and our longer summer, or in other words, on account of the longer time during which it is exposed to radiation without the compensating influence of the sun's rays. To this difference has been attributed the greater accumulation of ice at present at the south pole; and from it the inference has been drawn that, inasmuch as the elliptical figure of the orbit is constantly changing its position in space, in the course of 5,025 years, when the ellipse shall have so changed as to bring the nearest point of the orbit to the sun in the period of winter in the northern hemisphere, then the reverse condition will exist, namely, a greater accumulation of ice and a

more rigorous climate at the north.—The temperature, however, of a body in space like that of the earth, does not merely depend upon the amount of heat it receives from surrounding bodies, but also upon the nature of the transparent envelope or atmosphere which surrounds it. If we suppose heat to consist of vibrations of different lengths given off from all heated and luminous bodies, we might then infer what is really the case, that heat from different sources would possess different penetrating powers in regard to different substances. Now luminous rays, such as those which come from the sun and stars, readily penetrate transparent bodies; while dark rays, such as are given off from a vessel of boiling water or earth heated below redness, are stopped by these media. The atmosphere which surrounds the earth, as we have said, performs a similar part; it suffers at least three quarters of all the heat which falls perpendicularly upon it to reach the earth, and to warm the surface. This surface, however, radiates heat in turn, but not of the quality which can readily pass out into space through the atmosphere; it is therefore retained at the surface of the earth, of which the temperature is gradually increased until an equilibrium is produced between the amount received and that given off by radiation, an equilibrium which takes place at a temperature at the equator of about 82° F., and at zero of the same scale at the poles. We can see from this that, with an atmosphere that would more readily admit rays of high intensity and less readily radiate those of low intensity, the temperature of the surface of the earth would be much higher than it is even if it were situated at a greater distance from the sun. Were the earth covered with a surface of uniform material and without an atmosphere, its relative temperature at different times and on different parts of its surface could readily be calculated; but the diversity of the surface and the motion of the aerial covering give a complexity to the subject which renders the complete solution of the problem almost impossible. We are however able to obtain a general appreciation of these effects. Let us first consider the mechanical constitution and effects of the atmosphere. We may suppose this to be composed of atoms self-repellent, but subject to the attraction of gravitation, and therefore possessed of weight. The lower strata of such an atmosphere must be more dense than the upper, since each succeeding stratum as we pass downward is pressed into less space by the weight of all the superincumbent strata. A column of this atmosphere at the bottom has the temperature of the surface of the earth, and at the top that of celestial space, the temperature diminishing as we ascend, at least for accessible distances, on an average about 1° for each 300 feet. In order that such an atmosphere may be in a state of equilibrium, it is necessary to admit that each successive pound of air from the bottom to the top contains nearly the same absolute amount of heat,

the latent heat increasing and the temperature diminishing as we ascend; for in this case, if a portion of air be forced upward by any mechanical means, it will expand from a reduced pressure, and in thus expanding will diminish in temperature, since the same amount of heat which existed in a cubic foot of air at the bottom of the column is now distributed through a larger space; and if a portion of the same fluid be brought down to a lower level, its temperature will rise, its density increase, and it will be again found in the same thermal and mechanical equilibrium. In order therefore to a stable equilibrium, one that is not readily disturbed, the superior stratum of atmosphere ought really to contain a little more heat than the inferior one. The ascent and descent of air therefore into the atmosphere, if effected by mechanical means, could produce little or no change of temperature. The blowing of a wind, if it be perfectly dry, over a high mountain ridge, ought not to decrease its temperature, since the cold produced by the expansion would merely reduce the warm current from below to the normal temperature at the top of the ridge; and if the current continued its passage and descended on the other side to the level of the sea, it would be again of the same temperature as when it began to ascend. This, however, will not be the case with a mixed atmosphere, containing as ours does a considerable amount of vapor of water. The latter, by being carried up to a high elevation, will deposit a portion of its vapor on account of the reduction of temperature, and in doing this will give out a portion of its latent heat to the surrounding air, and prevent the temperature of this from sinking as low as it would were it not subjected to this influence; and in this case the air will descend to the level of the sea actually warmer as well as drier than when it went up. Although the mean temperature for a whole year of a wind blowing over a mountain ridge would be little or nothing diminished, yet if it blows over in summer or while the mountain is abnormally cooled with the remains of winter snow, the temperature of the wind will be less than that of the air in the plain below.—Again, it is evident that the temperature of a particular part of the earth must depend not only on the amount of heat which it receives directly from the sun, but also on the direction and quality of the winds to which it is subjected. When water is converted into vapor, as we have seen in evaporation, a large amount of heat is rendered latent; and when the vapor is condensed again into water, under whatever conditions the condensation takes place, the same amount of heat must be evolved. Every foot of water, therefore, which falls in the form of rain, must leave in the atmosphere as much heat as that required to reconvert the same amount of water into the state of vapor. We see from this simple consideration that the vapor contained in the atmosphere carried by the winds from one part of the earth to another, distributes and equalizes the heat which the re-

diation from the sun tends to accumulate in the equatorial regions. Let us therefore next consider the circulation of the winds, than which at first sight nothing would appear more uncertain. The motion, however, of every particle of matter on the surface of the earth, is governed by laws as fixed and immutable as those which control the movements of the planets of our system, although, when the conditions under which these laws operate are much diversified and various perturbing influences are introduced, the resultant is difficult of estimation. Such is the case with the motion of the winds; still their general circulation has been made out with considerable certainty. If our earth were subjected alone to the heat of the stars, this being equal on all sides, no motion of the air would ensue; but the circumstance that the perpendicular rays of the sun are confined to the torrid zone, gives a great preponderance of heat in the equatorial regions, and hence causes a constant circulation of the air. The temperature of the equator is on an average about 82° , while the temperature of the polar regions is about zero. It follows from the law of expansion by heat, that the air at the equator will be enlarged in volume, and that its upper surface will tend to stand much higher than that at the pole. The air at the equator will therefore roll over toward the poles, increase the pressure on these parts of the earth, and diminish it in the equatorial regions. The heat being continued, the air would be pressed in from N. and S., would become heated, would ascend on account of the pressure on each side, and in this way a constant circulation would be kept up, below from N. and S. on either side, toward the equator, thence upward, and gradually turning backward, would flow above, N. and S. again, toward the poles. The greater portion of this circulation, however, would be confined to about the parallel of 30° on either side of the equator, since the impulse in a perpendicular direction, which the air receives in its ascent, would tend to carry it higher than the point due to the statical pressure. The greater portion would consequently descend before proceeding far N. or S., and this effect would be further increased by the narrowing of the meridians; for it must be evident that all the air which ascended at the equator could not descend in the frigid zones, since the area of these spaces is far less than that around the equator. The principal circulation will therefore be confined to a belt on each side of the equator extending N. and S. about 30° . A portion, however, would pass entirely to the pole, or rather to the coldest point in each hemisphere, where by losing its heat it would become denser and sink down toward the surface to return again toward the equator. Such would be the simple circulation of the aerial ocean if no perturbing influence existed; but a number of modifying conditions must be introduced. First, the earth is not at rest, but in rapid motion on its axis from W. to E. Every atom of air therefore, as

it flows toward the equator on either side, must partake of the motion of the place from which it started, and in its progress must in succession reach parallels of latitude moving more rapidly than itself. It would therefore as it were continually fall behind the surface of the earth, and appear to describe a slightly curvilinear course toward the west. We have in this a conception of the cause of the great system of currents denominated the trade winds, which blow constantly between the parallels of 30° N. and 30° S. toward the belt of greatest rarefaction, from the N. E. in the northern hemisphere and from the S. E. in the southern. This motion, however, requires further consideration. The particles of air approaching the equator do not ascend in a perpendicular direction, as we supposed in the first case, but gradually rise as they advance toward the W. along an ascending plane, and continue for a time their westerly motion in each hemisphere after they have commenced their return to the pole. When the atoms of air forming this current arrive at their greatest altitude, they begin to flow backward toward the poles; but as they flow, for example, those in the northern hemisphere northerly, they arrive at parts of the earth moving less rapidly than themselves, and therefore curve round toward the E., and finally descend to the earth to become again a part of the surface trade wind from the N. E. To render this motion more clear, let us suppose a series of books to be placed side by side on edge in a N. and S. direction. The leaves of these books will represent the planes in which the air would circulate in the northern hemisphere were the earth at rest; but if the earth is supposed to be in motion, then the upper edges of the books must be inclined to the W. so as to make an acute angle with the horizon and overlap each other like the inclined strata in a geological model. If, on each leaf of each book, a circuit of arrows be drawn moving toward the S. below and toward the N. above, the assemblage of these will represent the paths of the different streams of the atmosphere in our hemisphere. A considerable portion of the circulation we have here described must descend to the earth within about 30° of the equator, as we have before stated, and reaches the earth to form again the current of the surface trade winds. A part, however, descends still further N., and another portion probably reaches the colder part of the frigid zone. A part of the principal descending current in the latitude of 30° N., particularly during our summer, is driven under the higher strata, and gives rise to a surface wind from the S., which on account of the rotation of the earth becomes S. W. and covers to a comparatively small depth the whole of the northern temperate zone. A similar wind also exists in the southern hemisphere. The greater cold of the frigid zones tends to produce an effect similar to the greater heat of the torrid zone; the air becomes more dense and sinks toward the surface, producing a descending column analo-

gous but reverse to that at the equator, and flows in every direction from the pole, turning rapidly however to the W. on account of the rotation of the earth. The current at the surface, therefore, at the latitude of 80° , would assume a direction toward the W. The resultant winds consequently at the surface of the earth, in the northern hemisphere, as shown by Prof. Coffin, form three great belts: 1, in the region of the equator, a perpetual wind from the N. E. extending with a variable limit to nearly the latitude of 80° ; 2, between 80° and 60° or 65° , a variable wind, the greater amount of which is from the westward; and 3, in the frigid zone, a wind from the N. E. If we ascend sufficiently high in the atmosphere in the northern tropical regions, say at the island of Cuba, we shall pass through the strata of surface trades, and enter those of the upper or reverse trade winds moving from the S. W. toward the N. E. Again, if we ascend in the belt of temperate zones, for example above the city of Washington, we shall first pass through the surface current from the S. W., sometimes from the N. W., and higher in the atmosphere a continued current from the W. and N. W. On the borders of the northern frigid zone, in ascending from the earth, we shall first encounter a wind from the N. E., and higher in the atmosphere, flowing toward the cold pole, a wind from the S. W. Similar circulations must take place in the southern hemisphere. There are therefore in all six belts of winds on the surface of the earth, three in each hemisphere, and between them a narrow belt of comparative calms near the equator, in which the currents of the trade winds neutralize each other, and ascend into the higher regions. The descending current at about the latitude of 80° also produces a narrow belt of comparative calms in both hemispheres. To give as it were greater complexity to these perturbations of the circulation of the atmosphere, the systems we have described are not fixed in position, but move N. and S. with the varying path of the sun in the heavens during summer and winter. Another principal cause of perturbation in the circulation of the winds, and consequently in the distribution of heat, is the vapor which mingles with the atmosphere. This is absorbed in large quantities by the surface trade winds as they flow from either side of the equator over the ocean to the belt of centre calms; it is there elevated with the air, and in a greater part immediately condensed by the cold of the higher regions, and consequently falls in torrents of rain, leaving in the atmosphere all the latent heat which it had absorbed in its evaporation from the surface of the ocean. The heat thus evolved increases the ascensional power of the rising column, and causes it to ascend higher than it would otherwise do, and to fall on each side more precipitately and in greater quantity nearer the place of its ascent. In a like manner the introduction of vapor into any portion of the atmosphere expands it, and renders the strata unstable in a perpendicular

direction, giving rise to local upmoving columns, and thus producing winds, rain, and all the fitful local changes of the atmosphere. The winds not only carry the vapor which they have absorbed from the surface of the ocean, and deposit it on the land, but they also transfer the heat in a similar manner from one part of the earth to another, and thus constantly vary the temperature which a given place would have were it alone subjected to the influence of the sun.—Another primary cause of the irregular distribution of heat on the surface of the earth is the currents of the ocean. The unequal heating of different parts of the earth by the sun, as we have seen, gives rise to great gyratory motions of the air, and it must be evident that there will be a tendency to produce similar motions in the aqueous envelope of the globe. But the immediate effect of the heating of the water at the equator by the sun, although it has its influence, is not sufficient to account for the actual phenomena. We think the currents of the ocean are mainly due to the effect of the trade winds, which, if no obstruction existed, would produce a current toward the W. at the equator entirely round the earth. This current, however, is obstructed by the two continents which are stretched across its path, and is deflected right and left or N. and S. at the western shore of each ocean, thus forming four immense circuits, viz.: two in the Atlantic, one N. and the other S. of the equator, and two in the Pacific. For a like reason there is produced a similar whirl in the Indian ocean—the current from the E. being deflected down the coast of Africa, and returning again into itself along a southern parallel of latitude to the W. side of Australia. Beside these great streams, the waters supplied by all the rivers emptying into the arctic basin must flow out, and in their progress to the south must tend westward on account of the rotation of the earth producing a cold current from each pole along the E. shore of each continent, such as that which flows S. close to the shore along our coast. To illustrate the effect of these great gyrations of the ocean, let us consider the one which is best known, the Gulf stream. The trade wind, acting upon the waters near the equator, and sending them toward the W., gives rise to the great current which, interrupted by the islands of the Caribbean sea and the isthmus of Darien, is deflected along the E. coast of the United States, thence over to the coast of Europe, and down the coast of Africa, until it has completed its circuit in a period of from two to three years. In crossing the Atlantic it sends off a branch, as it were, which, passing among the islands of Great Britain, along the coast of Norway, and into the arctic regions, always tending eastward on account of the revolution of the earth, carries the water from the gulf of Mexico, one of the hottest portions of the earth, far to the N. and E., and produces an increase of temperature in these regions much above that which would be due to their position in regard to the sun.

Without this convective transfer of heat, Great Britain would be almost as inhospitable a region as the shores of Labrador, which are under the same parallel. This circuit produces very little effect, however, on the climate of the United States, since between it and our coast is the cold current from the north. Beside this, the heat which the eastern portion of our country might derive from the Gulf stream is carried away eastwardly by the prevailing westerly winds of the temperate zone. The gyration in the southern Atlantic is less marked, but still it carries the warm current along the coast of Brazil, which loses its high temperature by the time it has crossed the most southern point in the Atlantic ocean, and returns up along the western coast of Africa, to ameliorate the climate of that portion of the earth. The great currents of the Pacific are almost precisely similar in character to those of the Atlantic. Starting from the W. coast of America, the current, impelled by the trade winds toward the W., is deflected N. and S., and, divided into two great whirls by the continent of Asia and the adjacent islands, the northern flows along the coast of Japan and recrosses the ocean in the region of the Aleutian islands, and thence down the coast of Oregon and California to return into itself near the equator. This circuit, although it has very little influence upon the climate of China, materially affects that of the W. coast of North America. The water which ascends to the N. along the coast of Asia, loses a considerable portion though not all of its heat in crossing the Pacific, and, descending to the S. along the W. coast of America in a broad stream, imparts to the air in contact with it a mildness and equability of temperature which, carried eastward on to the land, imparts to our W. coast the agreeableness of its climate. The polar stream of cold water which flows out principally at the bottom of Behring's straits, tends, on account of the revolution of the earth, to hug the coast of Asia, and to flow between it and the Gulf stream of that region, as in the case of the streams on the E. coast of North America. A little reflection will enable the reader to trace out the effects of the other great whirls we have mentioned in the distribution of heat over the globe. But it ought to be stated, that in the descriptions we have given we have not considered the annual perturbations to which these currents are subjected on account of the varying position of the sun, and consequently the varying direction of the wind, our object being to give general views not too much complicated by multiplied conditions. It will be seen from an examination of the whole effect of the currents of the ocean, that on an average the isothermal lines, or lines of equal temperature, on the water, are carried further to the north in the northern hemisphere and further to the extreme south in the southern hemisphere than on the land. The temperature of the North American continent is perhaps more depressed than that of Europe and Asia, because the water which evaporates from Hud-

son's bay and the various inlets connected with it is restored by cold currents from the arctic regions. Perhaps the coldest meridian in the northern portion of the earth is near that passing through Washington.—We shall next consider the meteorological effects of the mountain systems of the earth. If these are placed E. and W. in the temperate zones, they will have comparatively little effect upon the meteorology of the country; but if they are placed N. and S., or cross the great aerial currents, they will then exercise a very controlling influence. Let us suppose a wind from the west, for example, blowing over the surface of a level country in the temperate zone. It will precipitate none of its moisture, because its temperature remains above that point at which the moisture can be sustained. But if the same current be deflected up the W. side of a mountain extending N. and S. into a higher and colder region, its vapor will be converted into water, or into that intermediate condition called cloud, which, descending in rain, will fertilize the W. slope of the mountain system, while on the E. side there will be a deficiency of moisture and a want of rain. This is the case with all mountains of sufficient elevation in the temperate zones, which extend in a N. and S. direction, and is particularly illustrated by the effect of the Rocky mountain system on the western part of this continent, and the Andes on that of South America. In the torrid zone, and within the region of the trade winds which blow from the east, the E. side of the mountains receives the precipitation, while the W. side is deficient in moisture. Hence the rainless portions of Peru and Central America. The Alleghany mountains are generally not of sufficient height to produce much effect in this way, and furthermore their direction is nearly parallel with that of the fertilizing or prevailing surface wind from the S. W. From the great currents of the air which we have described, it must be evident that the tendency of all disturbances in the equatorial regions must be to move westwardly, and in the temperate zones to move eastwardly. It has accordingly been found that heated and cold terms generally commence at the N. W. part of our continent, descend to the S. along the base of the Rocky mountains, and at the same time sweep eastward over the whole continent. The same is the case with great storms of rain and wind, particularly those which occur in winter, spring, and autumn. In summer these commotions are more local, and consist principally of thunder gusts, which however in every part of the United States pursue an easterly course. The explanation, or at least the approximate cause of the fall of rain and of fitful winds, is found in the unstable condition of the atmosphere produced by the gradual introduction into the lower stratum of the vapor of water. This, with the accompanying heat, tends to expand the air, and consequently to render it lighter; and when the amount of vapor becomes sufficiently great, the order of density of the strata

is in a measure reversed, and a state of tottering equilibrium is produced; the lower stratum tends on the least disturbance to break through into the colder, and to carry with it the moisture which it contains at the surface of the earth, and which, condensed by the cold in the upper regions, falls again in rain. We owe to the late Mr. Espy of this country an exposition of the effects which must flow from the bursting up of the moist stratum of air through the upper into the colder regions, and the consequent production of rain. We do not think the mere mingling of currents, as was supposed by Hutton, is at all an adequate cause, while the upward motion consequent on the instability produced by the vapor itself possesses all the characteristics of a cause both true and sufficient. It follows as a corollary from this theory, that places on the surface of the earth which superabound in moisture must be liable to great commotions of the atmosphere, as well as falls of rain. The equatorial belt of calms between the trade winds is consequently subject to rain every day, and in such quantities that fresh water may sometimes be scooped up from the surface of the ocean. Along the whole course of the Atlantic Gulf stream, from Florida to the coast of Ireland, the water possesses a temperature above that due to the latitude, and the lower stratum of air resting upon it is therefore warmer and moister than that on either side. It is consequently in a state of tottering equilibrium, and ready to burst up into the upper and colder strata, carrying with it the moisture to be condensed in torrents of rain, and drawing in around the ascending column the adjacent air, to give rise to the fearful cyclones which, commencing in the Caribbean sea, sometimes travel with unabated fury along the entire axis of the stream to the coast of Great Britain. Similar cyclones, and from a similar cause, are produced over the heated stream which flows along the E. coast of Asia, the same principle affording a simple explanation of similar tornadoes in the southern Atlantic and Pacific as well as in the Indian ocean. We have called these storms cyclones, not meaning however to adopt the hypothesis that they are simple horizontal whirlwinds, but upward and spirally in-blowing gyrations. We owe principally to the late Mr. Redfield, as is stated in the article *HURRICANE*, the establishment of the fact of the gyratory motion of these storms, and to Mr. Espy the proof that the principal motive force acts in a vertical direction, and consists in the rushing in and upward of the moist stratum from the surface, and the consequent evolution of the latent heat of the vapor which it contains. Indeed, it is almost impossible that an upward rushing of streams of air should take place over a small circumscribed area without their assuming a gyratory motion. When however the uprising column is of great extent, this tendency to gyrate is merged in the different directions of the various streams, and hence all the storms which visit our continent are not

of this character. Beside the class of storms which have been denominated cyclones, and which follow the general course of the Gulf stream lapping over our E. coast, there is another class to which we first alluded, which commence in the interior of the continent, and are borne along eastwardly by the westerly wind of the temperate zone. For example, after a gentle S. wind has blown for several days, particularly in autumn, winter, or spring, the surface stratum of air, beginning at the Rocky mountains and extending to the eastern seaboard, becomes abnormally moist and warm; it therefore frequently begins at the E. base of these mountains to burst upward, carrying with it into the colder strata the vapor with which it is loaded, to be precipitated in rain, giving rise to a wind from the eastward on the E. side of the storm and from the westward on the W. side. The commotion is borne eastward by the upper or prevalent westerly currents at a variable rate, from 10 to 30 m. per hour, sweeping over the whole distance from the place of its origin until it mingles with the storms of the Gulf stream. In some cases these storms extend from N. to S. over a considerable portion of the continent; but more generally the stormy condition of the atmosphere is in detached portions, each however moving eastward. In summer, the unstable condition of the atmosphere produced by the heat and moisture of the day is frequently reversed in the afternoon by thunder storms at various places, all however as a general rule moving eastward. The storm systems of Europe and Asia are similar to those of America, but more modified by the irregular direction of the mountain chains.—In this sketch we have confined ourselves for want of space to the most prominent points of the science; and in conclusion, we can only refer to the important observations collected at the national observatory, under the direction of Lieut. Maury, relative to the winds and currents of the ocean in every part of the world; to the meteorological system of the war department under Surgeon-General Lawson, and discussed by Dr. R. H. Coolidge; to the labors of the late Mr. Redfield, Mr. Espy, Prof. Loomis, Prof. Guyot, and Prof. Coffin, also to those of Dr. Hare; and to the accumulation of materials relative to the North American continent at the Smithsonian institution, under the direction of Prof. Henry, beside the systems which have been established in different states of the Union. Most of the civilized governments of Europe have also organized systems of simultaneous observations, by which as in America the progress of storms may be noted. These, with the aid of the telegraph, cannot fail to advance the science more rapidly than has ever been done at any other period of its history.

METER (Gr. *μετρον*, a measure), a word much used in combination with others to designate various measuring instruments, as thermometer, a measurer of temperature, hydrometer, measurer of the density of water, &c. When

standing alone, it is commonly understood to apply to the instruments used for measuring gas, which are described in the article GAS, or to similar contrivances for measuring the quantities of water discharged through pipes. In supplying water to cities, the want is beginning to be sensibly felt of some cheap and accurate apparatus that shall register the amount consumed by different customers, in the same way that the consumption of gas is determined; and various meters have been contrived for this purpose. But the difficulties of providing a cheap measurer, that can be depended upon for large and small quantities, delivered slowly or rapidly, are much greater when the object of the measurement is a heavy incompressible fluid, than when this is a highly elastic body like gas, which flows with little friction through pipes of different sizes and without regard to the number of bends or to differences of pressure arising from differences of elevation.—The water meters in use are of two distinct classes, one of which works in combination with compressed air, and the other without this. Of the non-atmospheric class, that of Mr. Henry Worthington of New York is perhaps the best. It consists of two cylinders placed side by side, with pistons so arranged that in working they alternately move the supply and delivery valves of the opposite cylinder. Each stroke being registered, the number of times the cylinders (the capacity of which is known) are filled and discharged is indicated. These meters are much used in New York, Boston, and other cities. Diaphragm meters of the same class are used in New York, and might be preferred to the piston and cylinder meters if it were not that the diaphragm soon wears out. Hughes's meter is a good example of this sort. A chamber is divided by a flexible water-tight diaphragm into two parts. The water entering and filling one presses the diaphragm into the other, which causes the valves to change, and the water to flow into the second chamber while it is discharged from the first. Each discharge is a measure equal to the capacity of the chamber. Meters of the character of those described are liable to get out of order from the clogging of the valves with the sediment deposited from the water, and in the case of pistons from derangement of the packing. The head of water is also more or less reduced by the force expended in moving the piston and the friction arising from passing short turns at the valves. There is also a nicety of construction necessary, which renders the instrument expensive. A third variety of this class may be called velocity meters, as they register the revolutions of a wheel which is moved by the current with a velocity proportional to its own. The wheel generally employed is that of the well known "Barker's mill," into which the water enters at the centre and passes out at the circumference nearly tangentially, imparting to the wheel a horizontal revolution. For swift currents these meters are very well adapted, but

if the flow is feeble the wheel, to turn at all, must be provided with such small apertures that they are likely to be clogged with the sediment. When faucets are left slowly running in cold weather to prevent freezing of the water, the meter may not register this flow however long it is continued; and supplies of water may thus be fraudulently obtained without any record of it. An English meter known as Seaman's is an excellent specimen of this kind. The pivot on which its wheel is hung on an inverted cup is ingeniously lubricated by oil floating on the water around it.—To the second class of meters, which may be called atmospheric, belongs Cochran's patent. The measurer is a double wedge-shaped vessel placed at the top of an air-tight case, and balanced so as to rock upon its edge. It is divided by a vertical partition into two triangular compartments. The water enters through the bottom of the case, and fills the first compartment, when it tilts and empties itself, bringing the second under the current, which repeats the operation. As the water enters the case it compresses the air contained therein, and its head is thus retained. The capacity of the air chamber is sufficiently great to prevent the water from rising so high as to interfere with the movement of the measuring buckets, each oscillation of which slides a valve, which lets out some of the water and admits a corresponding quantity of air, thus keeping up the supply. A large current is apt to cause the buckets to tilt before they are full; and if they are made proportionately large, the air chamber must also be greatly increased in size, making the machine bulky and expensive. In another form, that of Messrs. Curtis and Hoard, the water fills alternately one of a pair of upright cylinders, in the upper parts of which floats raised by the water work the valves.—A compressed air meter, recently patented by Mr. B. S. Church of New York, consists of a cylindrical wheel into which the water passes at its axis and flows into compartments on its periphery, until the weight causes them to revolve and discharge themselves, the wheel being upon a horizontal axis. A float within the wheel detains each bucket until it is exactly filled. It is made applicable to the measurement of a large current by dividing this as it enters the wheel and measuring only a part, the proportion measured being indicated by the registering apparatus. The escape of the air in bubbles together with the water, which is a fault in other atmospheric meters, is prevented by causing the current to flow under and over partitions, the effect of which is to make the bubbles rise and burst. A monitor valve is also attached to prevent the drawing of water should the air escape in sufficient quantity to disturb the measurement, in which case a fresh supply of air may be introduced by loosening a screw at the side and emptying the meter.

METHODISM. In 1729 John Wesley, a fellow of Lincoln college, Oxford, being impressed with the need of greater spirituality in religion

by an attentive perusal of the works of the Rev. William Law, particularly his "Call to a Holy Life," and also the writings of Thomas à Kempis, organized small evening meetings, with his brother Charles, a student at Oxford, Mr. Morgan, commoner of Christchurch, and Mr. Kirkham of Merton college. In a short time two or three pupils of John Wesley and one of Charles Wesley's pupils obtained the privilege of attending these meetings. They soon began to give evidence of spiritual improvement by visiting the sick in the town and the prisoners who were confined in the castle. After two years they were joined by Mr. Ingham of Queen's college, Mr. Broughton, and Mr. Hervey, and subsequently by Mr. George Whitefield of Pembroke college, then in his 18th year. At the end of 6 years their number amounted to 14. The name of Methodists was given to them, not as a term of reproach, as is generally supposed, but on account of the exact regularity of their lives, and the manner of spending their time. The society was broken up by the departure of the Wesleys for Georgia as chaplains of the colony which had been planted there. On their return to England in 1738, John Wesley began to preach in the churches of London and other places; but he met with a cold reception, and was finally debarred admission to the pulpits. Not disconcerted, however, he preached in private houses, and in the streets, cemeteries, and fields. In his brother Charles he found a faithful coadjutor, and the result of their preaching was a general awakening on the subject of religion throughout the land. So numerous became their followers that they conceived the idea of forming them into classes according to their respective localities, and appointed over each a leader who was to look after their spiritual interests in their absence. Thus originated the Methodist societies in 1739. For the government of these societies the Wesleys drew up a set of rules. The only condition of membership was "a desire to flee the wrath to come and be saved from sin." These rules prohibited "profane swearing, Sabbath-breaking, drunkenness, buying or selling spirituous liquors or drinking them, fighting, quarrelling, brother going to law with brother, the using many words in buying or selling, the buying or selling of goods that had not paid the duty, the giving or taking things on usury, or unlawful interest, uncharitable speaking, wearing of gold or costly apparel, laying up treasure on earth, borrowing without the probability of paying, or taking up goods without the probability of paying for them." These things were particularly specified, because, as the rules state, they were "most generally practised" at that time. They enjoined the observance of the following: "The doing good of every possible sort and as far as possible to all men, by giving food to the hungry, clothing the naked, visiting or helping those who were sick and in prison, by instructing, reproving, and exhorting all they had any intercourse with; doing good especially to those who are of the

household of faith, employing them in preference to others, buying one of another, helping each other in business; attending upon all the ordinances of God, such as public worship, the ministry of the Word whether read or expounded, the supper of the Lord, family and private prayer, searching the Scriptures, and fasting or abstinence." Encouraged by the success which attended their ministry, the brothers travelled extensively throughout the kingdom, visiting the rudest and most populous districts, and everywhere producing a profound impression. It soon became necessary for them to employ lay preachers to assist them in preaching to and looking after the spiritual interests of the large societies which had been formed in different parts of the country. As the number of lay preachers increased, it became necessary for concert of action that an annual meeting should be held, which was denominated a conference, and has ever since borne that name. The first conference was held in 1747, at which John and Charles Wesley met two or three other ministers of the established church who sympathized with them, and the preachers whom they had appointed to come from various parts of the country to confer with them on the affairs of the societies. Since that time a conference has been annually held, John Wesley having presided at 47. Their deliberations, in the form of questions and answers, were afterward printed under the title, "Minutes of the several Conversations between the Rev. Mr. Wesley and others." In the early conferences various points of doctrine were discussed with reference to the adoption of a standard. Mr. Wesley adopted the articles of religion of the church of England for substance of doctrine, though he distinctly declared himself Arminian in relation to the article on predestination, understanding it in a sense not contrary to the doctrine of redemption and the possible salvation of the whole human race. The Wesleyan Methodists maintain the doctrines of original depravity, an unlimited atonement, justification by faith, and a divine assurance of acceptance with God. Since the organization of the Wesleyan church, though there have been several secessions from the body, it has gone on increasing steadily in power and influence until the present time, and is decidedly the largest and most influential of all the dissenting churches in Great Britain. The Wesleyan church has now 6 conferences, as follows: the British, including England, Wales, and Scotland; the Irish, the Australian, the Canada, the Eastern British American, and the French. In these conferences, including the numbers in foreign missions, embracing continental India, northern Europe, China, Asia Minor, the South sea, and West India islands, the membership is 482,446, and the number of ministers 2,459. For the support of their missions and schools, with other benevolent agencies connected with the church, a sum little less than \$1,000,000 is contributed annually.—The more important of the Methodist denominations are treated in separate articles; we

subjoin a table of the principal minor divisions in Great Britain and British America, with their statistics for 1859:

| Each. | Denominations. | Members. | Preachers. |
|------------------------------------|----------------|----------|------------|
| Primitive Methodists..... | | 122,863 | 610 |
| New Connection Methodists..... | | 24,296 | 186 |
| Church Methodists (Ireland)..... | | 9,158 | 78 |
| Calvinistic Methodists..... | | 58,577 | 207 |
| United Free Church Methodists..... | | 44,284 | 400 |
| Wesleyan Reformers..... | | 12,000 | |
| Bible Christians..... | | 21,666 | 169 |

METHODIST EPISCOPAL CHURCH, the name given to the society of Methodists in the United States. Methodism has existed in the United States since 1766, when a small number of immigrants from the Wesleyan connection in England formed themselves into a society in Philip Embury's carpenter shop on Barrack street, New York, near the present site of the city hall. The Methodist Episcopal church, however, as a separate and distinct organization, did not exist until Dec. 25, 1784, when, at the conference called for the purpose at Baltimore, the preachers assembled and assumed the title of a church. In this act they took higher ground than ever Wesley, the founder of the sect, conceived of or designed. The societies which he had formed in various parts of the British empire never had risen to the dignity of a church either in their individual or confederate capacity. Wesley himself belonged to the church of England, and, loyal to the last, he enjoined upon all his followers the same adherence. No sacraments were administered or received by them outside of the churches of the establishment. All the Methodist preachers, with the exception of the Wesleys and a few other clergymen associated with them, were unordained or lay preachers. It was from this class that Wesley sent over helpers or assistants to the societies formed in the United States, and over these he exercised exclusive jurisdiction. Of these preachers, and others who had been raised up in America, the conference of 1784 was composed. Following in the footsteps of Wesley, they recognized the Episcopal church in this country, and sought the ordinances within her pale. Episcopal churches are still standing in New York and elsewhere, at whose altars Embury, Pilmoor, Boardman, Strawbridge, Asbury, and Rankin, the earliest Methodist preachers, received the holy communion. It was not long, however, before dissatisfaction, joined with no little disaffection, arose among the preachers, particularly in the South, in regard to the ordinances. Many of the English preachers, adhering to the advice of Wesley, both in regard to state and church loyalty, unable to resist the influence and power of public opinion, had returned to England. Asbury, who had become an American in his views and feelings, and was unwilling to return with his English brethren, found it necessary, such was the opposition to English preachers, to retire from public life, and remained in the house of a friend in Delaware for two years

during the revolutionary struggle. Such being the state of things in this country, Wesley saw that an independent society was inevitable, and, that he might not lose his hold upon the American Methodists, he set himself to work to prepare for the emergency. He saw that the preachers would be satisfied with nothing short of ordination. He was a presbyter of the church of England, and having satisfied himself that presbyter and bishop were one and the same order in the original church, differing only as to their official functions, he assumed the office of bishop, and with the assistance of other presbyters of the same church he set apart and ordained the Rev. Thomas Coke, LL.D., of Oxford university, already a presbyter, as bishop of the infant church in America. After this was done, he sent Dr. Coke with his credentials of office to America, and in course of time the newly ordained bishop appeared in full canonicals at the conference of 1784 already referred to. Coke was unanimously recognized by that body as their bishop, and at once entered upon the discharge of his episcopal functions. Accompanying his credentials he had instructions from Wesley to set apart Francis Asbury to the same office, as joint bishop with him in the government of the church. Asbury was accordingly ordained, and subsequently a considerable number of preachers were set apart by ordination as deacons and elders. The letters from Wesley also gave them permission to organize a distinct church under the episcopal form of government which he had provided; this they did, and assumed the title of the "Methodist Episcopal Church in the United States of America." But almost from the very commencement there were some who did not altogether relish the idea of an episcopal form of government. They believed that it was even contrary to Wesley's design, though he doubtless conferred all the powers and prerogatives of such a government. So strong became the anti-episcopal party, that in process of time (1830) a large secession took place, and another organization was formed, denominated the "Methodist Protestant Church."—The Methodist Episcopal church, like some other churches in this country, has been thrown into excitement on the subject of slavery. In the very first conferences held, when slavery existed in the northern and middle as well as in the southern states, the subject was introduced and discussed, and resolutions were passed not only in regard to the traffic in slaves, but regulations were adopted in regard to the holding of them by the members, and requiring their emancipation at certain ages where allowed by the laws of the state. Preachers and official members were also, under certain limitations, prohibited from holding slaves. Slavery has continued to be more or less a subject of agitation to the present time; and though the laity have been allowed to hold slaves, the ministry have been prohibited from so doing except under certain circumstances, where they were held for purposes

of humanity. In 1844 the slavery question occasioned the withdrawal of the southern conferences, with one exception, from the jurisdiction of the church, and the organization of a separate and distinct church under the title of the "Methodist Episcopal Church, South." (See **METHODIST EPISCOPAL CHURCH, SOUTH.**)—The doctrines of the Methodist Episcopal church are contained in 25 articles, and are as follows: "1. There is but one living and true God, everlasting, without body or parts, of infinite power, wisdom, and goodness, the maker of all things, visible and invisible. And in unity of this Godhead, there are three persons, of one substance, power, and eternity—the Father, the Son, and the Holy Ghost. 2. The Son, who is the Word of the Father, the very and eternal God, of one substance with the Father, took man's nature in the womb of the blessed Virgin; so that two whole and perfect natures, that is to say, the Godhead and manhood, were joined together in one person, never to be divided, whereof is one Christ, very God and very man, who truly suffered, was crucified, dead, and buried, to reconcile his Father to us, and to be a sacrifice, not only for original guilt, but also for the actual sins of men. 3. Christ did truly rise again from the dead, and took again his body, with all things appertaining to the perfection of man's nature, wherewith he ascended to heaven, and there sitteth until he return to judge all men at the last day. 4. The Holy Ghost, proceeding from the Father and the Son, is of one substance, majesty, and glory with the Father and the Son, very and eternal God. 5. The Holy Scriptures contain all things necessary to salvation; so that whatsoever is not read therein, nor may be proved thereby, is not required of any man, that it should be believed as an article of faith, or be thought requisite or necessary to salvation. In the name of the Holy Scriptures we do understand those canonical books of the Old and New Testament of whose authority was never any doubt in the church. 6. The Old Testament is not contrary to the New, for both in the Old and New Testament everlasting life is offered to mankind by Christ, who is the only Mediator between God and man, being both God and man. Wherefore they are not to be heard who feign that the old fathers did look only for transitory promises. Although the law given from God by Moses, as touching ceremonies and rites, doth not bind Christians, nor ought the civil precepts thereof of necessity be received in any commonwealth, yet notwithstanding, no Christian whatsoever is free from the obedience of the commandments which are called moral. 7. Original sin standeth not in the following of Adam, as the Pelagians do vainly talk, but it is the corruption of the nature of every man that is naturally engendered of the offspring of Adam, whereby man is very far gone from original righteousness, and of his own nature inclined to evil, and that continually. 8. The condition of man after the fall of Adam is such, that he cannot turn and prepare himself, by his own natu-

ral strength and works, to faith and calling upon God; wherefore we have no power to do good works, pleasant and acceptable to God, without the grace of God by Christ preventing us, that we may have a good will, and working with us when we have that good will. 9. We are accounted righteous before God, only for the merit of our Lord and Saviour Jesus Christ by faith, and not for our own works or deservings; wherefore, that we are justified by faith only, is a most wholesome doctrine and very full of comfort. 10. Although good works, which are the fruits of faith, and follow after justification, cannot put away our sins, and endure the severity of God's judgments, yet are they pleasing and acceptable to God in Christ, and spring out of a true and lively faith, insomuch that by them a lively faith may be as evidently known as a tree is discerned by its fruit. 11. Voluntary works, beside, over, and above God's commandments, which are called works of supererogation, cannot be taught without arrogance and impiety. For by them men do declare that they do not only render to God as much as they are bound to do, but they do more for his sake than of bounden duty is required; whereas Christ saith plainly: When ye have done all that is commanded you, say, We are unprofitable servants. 12. Not every sin willingly committed after justification is the sin against the Holy Ghost, and unpardonable. Wherefore the grant of repentance is not to be denied to such as fall into sin after justification; after we have received the Holy Ghost, we may depart from grace given, and fall into sin, and by the grace of God rise again and amend our lives. And therefore they are to be condemned who say they can no more sin as long as they live here, or deny the place of forgiveness to such as truly repent. 13. The visible church of Christ is a congregation of faithful men, in which the pure word of God is preached, and the sacraments duly administered according to Christ's ordinance in all those things that of necessity are requisite to the same. 14. The Romish doctrine concerning purgatory, pardon, worshipping, and adoration as well of images as of relics, and also invocation of saints, is a fond thing vainly invented, and grounded on no warrant of Scripture, but repugnant to the Word of God. 15. It is plainly repugnant to the Word of God, and the custom of the primitive church, to have public prayers in the church, or to administer the sacraments, in a tongue not understood by the people. 16. Sacraments ordained of Christ are not only badges or tokens of Christian men's profession; but rather they are certain signs of grace, and God's good will toward us, by the which he doth work invisibly in us, and doth not only quicken, but also strengthen and confirm our faith in him. There are two sacraments ordained of Christ our Lord in the gospel; that is to say, baptism and the supper of the Lord. Those five commonly called sacraments, that is to say, confirmation, penance, orders, matrimony, and extreme unction, are

not to be counted for sacraments of the gospel, being such as have partly grown out of the corrupt following of the apostles, and partly are states of life allowed in the Scriptures, but yet have not the like nature of baptism and the Lord's supper, because they have not any visible sign or ceremony ordained of God. The sacraments were not ordained of Christ to be gazed upon, or to be carried about; but that we should duly use them. And in such only as worthily receive the same, they have a wholesome effect or operation; but they that receive them unworthily, purchase to themselves condemnation, as St. Paul saith, 1 Cor. xi. 29. 17. Baptism is not only a sign of profession, and mark of difference, whereby Christians are distinguished from others that are not baptized, but it is also a sign of regeneration or the new birth. The baptism of young children is to be retained in the church. 18. The supper of the Lord is not only a sign of the love that Christians ought to have among themselves one to the other, but rather is a sacrament of our redemption by Christ's death; insomuch that, to such as rightly, worthily, and with faith receive the same, the bread which we break is a partaking of the body of Christ, and the wine which we drink is a partaking of the blood of Christ. Transubstantiation, or the change of the substance of bread and wine in the supper of the Lord, cannot be proved by Holy Writ, but is repugnant to the plain words of Scripture, overthroweth the nature of a sacrament, and hath given occasion to many superstitions. The body of Christ is given, taken, and eaten in the supper, after a heavenly and spiritual manner. And the means whereby the body of Christ is received and eaten in the supper, is faith. The sacrament of the Lord's supper is not by Christ's ordinance reserved, carried about, lifted up, or worshipped. 19. The cup of the Lord is not to be denied to the lay people, for both the parts of the Lord's supper by Christ's ordinance and commandment ought to be administered to all Christians alike. 20. The offering of Christ, once made, is that perfect redemption, propitiation, and satisfaction for all the sins of the whole world, both original and actual, and there is none other satisfaction for sin but that alone. Wherefore the sacrifice of the mass, in the which it is commonly said that the priest doth offer Christ for the quick and the dead, to have remission of pain or guilt, is a blasphemous fable, and dangerous deceit. 21. The ministers of Christ are not commanded by God's law either to vow the state of single life or to abstain from marriage; therefore it is lawful for them, as for all other Christians, to marry at their own discretion, as they shall judge the same to serve best to godliness. 22. It is not necessary that rites and ceremonies should in all places be the same, or exactly alike; for they have been always different, and may be changed according to the diversity of countries, times, and men's manners, so that nothing be ordained against God's Word. Whosoever,

through his private judgment, willingly and purposely doth openly break the rites and ceremonies of the church to which he belongs, which are not repugnant to the Word of God and are ordained and approved by common authority, ought to be rebuked openly, that others may fear to do the like, as one that offendeth against the common order of the church, and woundeth the consciences of weak brethren. Every particular church may ordain, change, or abolish rites and ceremonies, so that all things may be done to edification. 23. The president, the congress, the general assemblies, the governors, the councils of state, as the delegates of the people, are the rulers of the United States of America, according to the division of power made to them by the constitution of the United States, and by the constitution of their respective states. And the said states are a sovereign and independent nation, and ought not to be subject to any foreign jurisdiction. 24. The riches and goods of Christians are not common, as touching the right, title, and possession of the same, as some do falsely boast. Notwithstanding, every man ought, of such things as he possesseth, liberally to give alms to the poor, according to his ability. 25. As we confess that vain and rash swearing is forbidden Christian men by our Lord Jesus Christ and James his apostle, so we judge that the Christian religion doth not prohibit, but that a man may swear when the magistrate requireth, in a cause of faith and charity, so it be done according to the prophets' teaching, 'in justice, judgment, and truth.'—The "General Rules" for the government of the church are the same as those adopted by Wesley, except the one relating to slavery, and constitute the canons of the church. The legislative authority resides in the general conference, composed of delegates from the several annual conferences, which has full power to make rules and regulations for the church under the following restrictions: "1. It shall not revoke, alter, or change the articles of religion, nor establish any new standards or rules of doctrine contrary to the existing and established standards of doctrine. 2. It shall not allow of more than one representative for every 14 members of the annual conference, nor allow of a less number than one for every 45; provided, that when there shall be in any annual conference a fraction of two thirds the number which shall be fixed for the ratio of representation, such annual conference shall be entitled to an additional delegate for such fraction; and provided also, that no conference shall be denied the privilege of two delegates. 3. It shall not change or alter any part or rule of our government, so as to do away episcopacy, or destroy the plan of the itinerant general superintendency. 4. It shall not revoke or change the general rules of the church. 5. It shall not do away the privileges of the ministers or preachers of trial by a committee, and of an appeal; neither shall it do away the privileges of the members of trial before the society, or by a committee,

and of an appeal. 6. It shall not appropriate the produce of the book concern, nor of the charter fund, to any purpose other than for the benefit of the travelling, supernumerary, superannuated, and worn-out preachers, their wives, widows, and children. Provided, nevertheless, that upon the concurrent recommendations of three fourths of all the members of the several annual conferences who shall be present and vote on such recommendation, then a majority of two thirds of the general conference succeeding shall suffice to alter any of the above restrictions excepting the first article; and also whenever such alteration or alterations shall have been first recommended by two thirds of the general conference, so soon as three fourths of the members of all the annual conferences shall have concurred as aforesaid, such alteration or alterations shall take effect." The general conference meets quadrennially, and now (1860) has subordinate to it 51 annual conferences, including the Liberia and German conferences. Each annual conference consists of all the travelling preachers, deacons, and elders of a certain portion of country, who meet under the presidency of a bishop. The main business transacted at these meetings is the admission and ordination of preachers; an examination of the character and official administration of the members composing the conference; a review of the missionary, educational, and publishing interests; and the appointment of the ministers to their several stations and circuits for the year ensuing. The territory of the annual conference is divided into presiding elders' districts, comprising several circuits and stations, in each of which there is held a quarterly conference, composed of the travelling and local ministers, the exhorters, stewards, class leaders, and superintendents of Sunday schools. The quarterly conference manages the details of local interests connected with the station or circuit; is a court of appeals in the trial of church members; grants license to preach, and recommends suitable candidates for admission into the annual conference. The episcopal office, conferred by solemn ordination, is not considered as invested with the claim and right of a third order in the ministry *de jure divino*, and therefore clothed with powers emanating directly from God, and indispensable to the existence of a church; but *de jure ecclesiastico*, the offspring of the church, and not the church of it. In connection with the episcopate, the ministry embraces the orders of elders and deacons. To be eligible to full connection in an annual conference and the office of deacon, a preacher must have travelled two years as a probationer and stood suitable examinations. He is eligible to elder's orders after two years' further service. Preachers are not authorized to baptize or administer the Lord's supper. Elders are ordained by the bishops, and may administer all the ordinances. They have charge of circuits or stations, or sometimes are placed by the bishops over several circuits or stations, called collect-

ively districts, in which case they are known as presiding elders. Stewards are persons chosen by the quarterly conferences to take charge of and disburse all funds collected for the poor, the support of the ministry, and sacramental purposes. Class leaders are appointed by the preachers; their duty is to see all the members of their respective classes once a week, and receive their contributions for church purposes. Classes consist usually of 12 persons. The number of travelling and local preachers is 13,000, and the number of members, including probationers, is 956,555. The appointments of the preachers are made every year, and no preacher is allowed to remain more than two years in one station.—Beside the domestic missions and those among the Germans, Scandinavians, French, Welsh, and Indians in the United States, the church has missions in Africa, China, India, South America, Germany, Sweden, Norway and Denmark, Bulgaria, and the Sandwich islands. The amount contributed in 1859 was \$229,145. The Sunday schools of the church contain 695,320 scholars, and the receipts of the Sunday school union for 1859 were \$11,300. There is a tract society connected with the church, which publishes a large number of tracts and books in various languages. The book concern, situated in New York, and of which there are branches at Cincinnati, Chicago, and elsewhere, is an immense establishment, constituting the largest publishing house in America. The proceeds of this establishment are, according to the "Discipline" of the church, to be divided among the several annual conferences for the support of superannuated preachers, and the widows and children of such as have died in the ministry. The official organs of the church are a quarterly review, a monthly magazine, and 10 weekly journals. The educational department of the church has kept pace with the membership, and there are now under the patronage of the several annual conferences 24 colleges, 2 biblical institutes, and 120 seminaries.—The (Bethel) African Methodist Episcopal church seceded from the parent association in Philadelphia in 1787, and the Zion African Methodist Episcopal church in New York in 1820, both on account of the prevailing prejudice against persons of color. The two churches number 26,746 members, and 193 travelling and 444 local preachers; and the former has a book concern and missionary society.

METHODIST EPISCOPAL CHURCH, SOUTH. The Methodist Episcopal church in the United States was composed, up to 1844, of 88 annual conferences, the ecclesiastical organization including all the slaveholding states. As early as 1773 Methodist societies were in existence in Virginia; and in 1785 Methodism was introduced into South Carolina and Georgia. It flourished in the southern states, embracing not only multitudes of the negro population, but great numbers of slaveholders, in the ranks of its membership and ministry,

who were protected by express rules in the "Book of Discipline." In 1828 an eminent minister of one of the southern conferences, known to be a slaveholder, was elected by the general conference as the representative of the Methodist Episcopal church to the British conference. In all the general conferences, up to that of 1844, slaveholders among the southern delegates claimed and enjoyed a perfect equality of right and privilege with northern delegates; and it was declared by formal resolution, at the general conference of 1840, that "mere ownership of slave property, in states or territories where the laws do not admit of emancipation and permit the liberated slave to enjoy freedom, constitutes no legal barrier to the election or ordination of ministers to the various grades of office known in the ministry of the Methodist Episcopal church." At the general conference of 1844, in New York, proceedings not assuming judicial form, and unaccompanied with any regular impeachment, were instituted against the Rev. James O. Andrew, D.D., one of the bishops, a citizen of Georgia, who had married a lady possessed of slaves. These proceedings, after a protracted debate, were terminated by an act passed by a majority of the conference requiring the bishop to desist from the exercise of his episcopal functions on account of this connection with slavery. Thereupon the representatives of 13 annual conferences embraced in the slaveholding states, presented a declaration which set forth their solemn conviction that a continuance of the jurisdiction of the general conference over the annual conferences thus represented would be inconsistent with the success of the Methodist ministry in the slaveholding states. The declaration was accompanied by a formal protest against the action of the majority in Bishop Andrew's case, and this led to the adoption by the general conference of a plan of separation, according to which there was contemplated an amicable adjustment of boundary lines, and a fair division of property, should the annual conferences in the slaveholding states find it necessary to unite in an ecclesiastical connection distinct from that of the North. The church in the South and South West, in primary assemblies, and in quarterly and annual conferences, sustained the declaration of the delegates, and measures were immediately adopted for the assembling of a convention. This was held in May, 1845, at Louisville, Ky. Acting under the provisions of the plan of separation, and in pursuance of the formal instructions of the annual conferences, the convention dissolved the jurisdiction of the general conference over the conferences there represented, and created a separate ecclesiastical connection under the title of the "Methodist Episcopal Church, South." The first general conference of the organization thus formed was held at Petersburg, Va., the following year, the senior bishop of the M. E. church, Dr. Joshua Soule, having in the mean time attached himself to the southern church. A subsequent

general conference of the M. E. church of the North having repudiated the plan of separation, and refused to divide the property of the book concern, formerly held in common, suit was brought in the courts of the United States by the southern church, and a fair *pro rata* division was enforced.—The form of government in the M. E. church, South, is the same as that in its sister church of the North. There are 6 bishops and 24 annual conferences in the M. E. church, South. In 1845 the number of travelling preachers was 1,384; superannuated preachers, 90; local preachers, 2,550; white members, 380,710; colored members, 124,811; Indians, 2,978; total, 462,498. In 1859 the numbers stood: travelling preachers, 2,661; local preachers, 5,177; white members, 511,601; colored members, 197,848; Indians, 4,286; total, 721,023.—The missionary organization of the M. E. church, South, is mainly confined to the home work. This embraces missions to the plantation negroes, Germans, Indians, and among the poorer classes of the white population; and missions in China and Japan. Missions among the colored population were set on foot in 1829, chiefly through the instrumentality of the late Dr. Capers of South Carolina. In the lapse of 30 years this department of missionary labor in the South Carolina conference has increased to 27 stations, on which are employed 85 missionaries, and embracing upward of 11,000 church members. The southern Methodist church holds that slavery, wherever established and protected by constitutional law, is a civil question, with which ecclesiastical bodies have no authority to meddle, and that the true function of the church is to preach the gospel and administer the sacraments and discipline of Christ's religion to master and slave alike. The missionary revenue of the M. E. church, South, during the first year of its separate organization, was \$68,529. For the year 1859 the amount contributed for missionary purposes was \$214,664.—The educational department comprises 21 universities and colleges for young men, 28 colleges and 27 high schools for young women, beside institutions of lower grade. Much attention is paid to Sunday schools. A publishing house was established by the general conference of 1854, in Nashville, Tenn. During the first 5 years of its operations 600,000,000 pages were published. Depositories of its publications are established in all the principal annual conferences; and a vigorous movement is on foot to endow the establishment with a large, free cash capital. There are 8 religious newspapers published weekly in different parts of the connection; one "Sunday School Journal," and one "Ladies' Magazine," monthly; and one "Quarterly Review."—The doctrines of the M. E. church, South, are the same, that are taught by the other branch of the Methodist Episcopal church in this country.

METHODIST PROTESTANT CHURCH, a religious body formed in 1880 by a secession from the Methodist Episcopal church. The

primary causes of dissatisfaction were the episcopate and the organization of the conferences, whereby all authority in the church was virtually placed in the hands of the travelling preachers, to the exclusion of other ministers as well as lay members. From the very outset efforts were made by a minority in the church to secure a more general representation in the conferences, but without avail. In 1824 a meeting of the reformers was held in Baltimore, a "Union Society" was founded for the purpose of agitating the question of a change of government, similar organizations were recommended to be formed in various parts of the United States, and a periodical was established called "The Mutual Rights of the Ministers and Members of the Methodist Episcopal Church." In the spring of 1826 the Baltimore union society initiated a movement for a general convention to inquire into the expediency of making one united petition for general representation to the general conference of 1828. The convention was held in Nov. 1827, and the petition was presented, but received an unfavorable answer. The conservative portion of the church meanwhile opposed the reform movement with the utmost vigor. Union societies were everywhere condemned, and members were expelled for belonging to them in Tennessee, North Carolina, and Baltimore. The reformers now began to secede in considerable numbers. A convention met in Baltimore, Nov. 12, 1828, and drew up provisional articles of association; and on Nov. 2, 1830, another convention assembled at the same place, adopted a constitution and a book of discipline, and accepted for the new society the name of "Methodist Protestant Church." The Rev. Francis Waters, D.D., of Baltimore, was president of this convention.—The Methodist Protestant church holds the same doctrinal views as the parent body, and differs from it in few points of ecclesiastical government, though rejecting episcopacy. The general conference meets once in 7 years, and is composed of an equal number of ministers and laymen, namely, one delegate of each order from every 1,000 communicants. It has authority under certain restrictions to make such rules for the government of the church as may be necessary to carry into effect the laws of Christ; to fix the compensation and duties of travelling ministers and preachers, &c.; to devise means for raising money; and to regulate the boundaries of annual conference districts. The annual conference is composed of all the ordained itinerant ministers of the district, and has power to elect to orders, station ministers, preachers, and missionaries, make rules for defraying the expenses of their support, and fix the boundaries of circuits and stations; it chooses its own president yearly. The quarterly conference is composed of the trustees, ministers, preachers, exhorters, leaders, and stewards in the circuit of which it is the immediate official meeting. It examines the official character of its members, licenses preachers, re-

commends candidates for ordination to the annual conference, &c. There are classes, leaders, and stewards, as in the Methodist Episcopal church. The denomination has a board of foreign and domestic missions; book concerns at Baltimore, Md., and Springfield, Ohio; 7 colleges, 8 of which are for females; 2 other literary institutions; and 4 weekly periodicals. At the beginning it had 83 ministers and about 5,000 members; and at the 7th general conference (1858) there were 2,000 stationed ministers, 1,200 churches, 90,000 members, and \$1,500,000 worth of church property.

METHODIST (WESLEYAN) CONNECTION OF AMERICA, a religious body organized in 1843, and originally composed of seceders from the Methodist Episcopal church. Three questions were involved in the discussion that resulted in the secession, viz.: slavery, church government, and the sale and use of intoxicating drinks, of which the first was the most prominent and important. In Dec. 1834, an "Appeal against Slavery" was issued by a number of Methodist ministers, members of the New England and New Hampshire conferences, in which it was maintained that all slaveholding is wrong. This was soon replied to by a "Counter Appeal," signed by a number of leading ministers. In this review it was contended that slavery existed in the apostolic church, and that the apostles, instead of commanding its abolition, gave rules for its regulation. In this way the conclusion was intended to be reached that slaveholding in the M. E. church was not sinful. In the New Hampshire conference for 1835 a series of resolutions was offered, of which the following was the most objectionable to the pro-slavery party: "Resolved, that holding and treating the human species as property is a sin against God, and a violation of the inalienable rights of humanity." A motion to adopt being made, the chairman, Bishop Emory, refused to put the motion, and thereby involved in the discussion a question of church government, which became very exciting as it proceeded. The eastern conferences being over for the season, Bishops Hedding and Emory, who attended them, addressed a pastoral letter "To the Ministers and Preachers of the M. E. Church within the bounds of the New England and New Hampshire Conferences." In this address they strongly condemned the anti-slavery discussion, and recommended the members and friends everywhere by all lawful and Christian means to discountenance it. The presiding elders were especially exhorted to oppose such discussion by their counsel and example. They advised the preachers, the trustees, and other members, to refuse the use of their pulpits and houses for anti-slavery meetings. At the general conference held in Cincinnati in 1836, the following resolutions were adopted: "Resolved, by the delegates of the annual conferences in general conference assembled, that they disapprove in the most unqualified sense of the two

members of the general conference who are reported to have lectured in this city recently upon and in favor of modern abolitionism. Resolved, that we are decidedly opposed to modern abolitionism, and wholly disclaim any right, wish, or intention to interfere in the civil and political relation between master and slave, as it exists in the slaveholding states of this Union." The same conference sent out a pastoral address, in which similar views were expressed. Soon after this conference a strong opposition began to be manifested toward leading anti-slavery ministers and members of the church. The advice of the general conference was construed as law, for the violation of which ministers and members were liable to be tried and expelled. It was also decided by the highest authorities, that the ordination vows of ministers bound them implicitly to follow the advice of their superiors. Under these decisions many were tried, suspended, or excommunicated; and at the New York conference in 1838, 5 preachers were deprived of their sacred function. The breach grew wider every day, and the conflict more undisguised. Two points in the final issue were now clear and well understood by both parties. It was contended by one party that slaveholding was wrong in all circumstances, and that slaveholders ought not to be admitted to the church; by the other party, that slaveholding as it existed in the M. E. church was not sinful, and that no one ought to be subject to church discipline for merely owning or holding slaves. On the subject of church government the anti-slavery party contended that they had a right to speak, preach, write, and act against slavery; that it was a moral question which involved religious truth and duty, and with their views silence would be a crime; and they added, that the interests of the church were best advanced by yielding allegiance only to the truth and right. On the other hand, the authorities of the church insisted that Methodist conferences and churches have no right to act against slavery in their organic capacities; and they appealed in behalf of their own authority to the vows of ordination, which promised a willing obedience on the part of the candidate. The other side replied that at the time of their ordination they did not understand the pledge in the broad sense in which their opponents urged it. The natural result of these dissensions appeared in the withdrawal of numerous local societies, and a growing disaffection toward the M. E. church on the part of the anti-slavery members. These were almost all temperance men, and the position of the church with regard to the manufacture and sale of intoxicating drinks afforded them additional ground of complaint. One of the rules of the church was as follows: "If any member of our society retail or give away spirituous liquors, and any thing disorderly be transacted under his roof on this account, the preacher who has the oversight of the circuit shall proceed against him as in the case of other immoralities." As

the offence contemplated in this rule consisted wholly of disorderly conduct, the simple traffic was held to be constructively authorized; and this view was pressed with such force that in 1840, in the height of the discussion, the general conference struck the rule from the "Book of Discipline." This, however, did not check the assaults, because other rules were retained that covered the same ground. One such was the following: "No elder, deacon, or preacher among us shall distil or vend spirituous liquors without forfeiting his official standing." This was interpreted as permitting the traffic to lay members, and it was the fact that there were many members of the church in different parts of the country engaged in it, against whom the church did not or would not proceed. As these facts were examined and debated, many became convinced that it was morally wrong to remain in visible Christian fellowship with a church that tolerated such practices. While these events were transpiring, new causes of complaint arose under the question of church government, and open disobedience showed itself. In 1841, a church in Lowell, Mass., refused to receive the minister sent by the bishop to take charge of them. For this offence the preacher, by a public proclamation, pronounced them all out of the church, and at the next session of the New England conference the presiding bishop sustained the action of the preacher. At the same conference, a member offered a resolution which simply affirmed that slaveholding is a sin, but the bishop refused to entertain it. In Nov. 1842, Orange Scott, Jotham Horton, and La Roy Sunderland publicly proclaimed themselves withdrawn from the M. E. church; and one of their number, Mr. Scott, issued a weekly journal, the "True Wesleyan," devoted to the interests of the new movement. New secessions followed, and a convention preliminary to a permanent organization of the protesting elements was held in Andover, Mass., Feb. 1, 1843. At this convention principles were discussed and a call for a general convention issued, which was held at Utica, N. Y., May 31, 1843; when the "Wesleyan Methodist Connection of America" was organized, and articles of faith and a form of discipline were adopted.—The religious doctrines of this body are substantially the same as those of the M. E. church. Of their rules of morality the two following are distinctive: 1. Their rule in regard to slavery excludes from church membership and Christian fellowship all who buy or sell men, women, or children, with an intention to enslave or hold them as slaves, or claim that it is right to do so. 2. Their rule in regard to intoxicating drinks equally excludes all who manufacture, buy, sell, or use intoxicating liquors, or in any way intentionally and knowingly aid others so to do, unless for mechanical, chemical, or medicinal purposes. The government of the Wesleyan Methodist Connection is democratic, each church having power to act for itself, and ministerial equality is a funda-

mental idea with them. They style their organization a "connection," or union of churches; but in speaking of the whole in their relation to each other, they say the "Wesleyan Methodist churches." There is a quarterly conference with every pastoral charge (which may consist of one or more churches), composed of all its officers. It has power to license preachers, and to recommend the licentiates to the yearly conferences. The latter are composed of all the ministers within their several geographical bounds, together with an equal number of laymen. They have power to elect elders and to ordain them, and to make rules for their own government. The general conference is composed of an equal number of ministers and laymen elected at the several yearly conferences. It has power to make rules for the whole connection. The whole number of members in 1858 was 20,000; of ministers engaged in the regular work, 800. The connection has two colleges under its control, viz.: Michigan union college, at Leoni, Jackson co., Mich., and the Illinois institute, at Wheaton, Du Page co., Ill.

METHODIUS AND CYRILLUS, two Greek missionaries of the 9th century, natives of Thessalonica, and supposed to have been brothers. Methodius had in early life acquired celebrity as a painter in Rome; afterward he went to Constantinople, and entered a monastery of Basilians. Having been sent to preach the gospel to the Bulgarians, Bogoris their king, who had heard of his skill with the pencil, desired him to paint a picture more terrible than any he had ever seen. Methodius painted one of the "Last Judgment," which so affected Bogoris that he immediately embraced Christianity; and the conversion of the king was quickly followed by that of the entire nation. Accompanied by Cyrillus, Methodius then proceeded to the Slavic tribes beyond the Danube, and became the founder of the Pannonian church, of which he was the first bishop. This event took place about 868. The two brothers also brought with them the arts of civilization, invented a Slavic alphabet, and translated for their converts the Sacred Scriptures and the liturgy. Some authorities assert that Methodius likewise converted the Bohemians and their duke Borziwoi. The time of the death of these brothers is uncertain. Methodius was canonized, and his festival is celebrated in the Greek church on May 11.

METONYMY (Gr. *μετα*, denoting change, and *ονομα*, a name), in rhetoric, a trope by which one word is substituted for another, to which it stands in a certain evident relation. The substance may be named for the quality, the cause for the effect, the precedent for the consequent, or the reverse. Thus, "gray hairs" may stand for "old age," the name of Virgil for that of his writings, the "head" for the "intellect," and the "olive branch" for "peace."

METRE, the French elemental unit of length, upon which the other measures of capacity and weight in what is called the metrical system are

based. (See **LITRE** and **GRAMME**.) In the absence of any other natural standard, it was determined at the period of the first revolution to adopt an aliquot part of the terrestrial meridian; and in 1795 a provisional measure was adopted, supposed to be the ten millionth of the quadrant, or the forty millionth of the whole circumference, measured over the poles. By the law of 1799 this was slightly changed, though probably rendered less correct, in accordance with the results of the measurements of an arc of the meridian between the parallels of Dunkirk and Barcelona, undertaken for this purpose by Delambre and Méchain. (See **EARTH**.) The difference, however, is only about $\frac{1}{100000}$ of the length, or less in a single metre than $\frac{1}{100000}$ of an inch. The length of the metre as thus fixed is equal to 3.2808992 English feet, or very nearly 39.37079 English inches. For expressing the decimal multiples of the metre, and also of the units of the other measures, prefixes derived from the Greek were adopted, viz.: *deca*, meaning 10 times; *hecto*, 100 times; *kilo*, 1,000 times; and *myria*, 10,000 times. For the decimal parts the prefixes were from the Latin, viz.: *deci*, $\frac{1}{10}$; *centi*, $\frac{1}{100}$; and *milli*, $\frac{1}{1000}$. The unit of square measure is a square decametre, or 100 square metres, and is called an *are*. It is equal to 119.6088 square yards, or nearly $\frac{1}{4}$ of an English acre.

METTERNICH, **CLEMENS WENZEL NEPOMUK** **LOTHAR**, prince, an Austrian statesman, born in Coblenz, May 15, 1778, died in Vienna, June 11, 1859. His ancestors had held a high position in the German empire since the 17th century, members of the family having repeatedly filled the archbishoprics of Treves and Mentz, and the Metternichs possessing the largest interest in livings and stalls connected with all the German sees and in the election of bishops. He continued the career of his father, who had obtained some reputation as a diplomatist and as the associate of Kaunitz, studied at Strasbourg, where he had for his fellow student Benjamin Constant, and made his first public appearance as master of ceremonies at the coronation of Leopold II. (1790). Subsequently he spent some time in Mentz in the study of jurisprudence, made a journey to England, became Austrian ambassador at the Hague, and married in 1795 the granddaughter and heiress of Kaunitz, whose large domains, added to his own patrimony, which included extensive estates in Bohemia, Moravia, on the lake of Constance, and on the Rhine, gave him a foremost position among the wealthiest landholders of Germany, and in connection with his high rank, varied attainments, and accomplishments, led to his rapid advancement. He first came into prominent notice at the congress of Rastadt (1797-'9) as the representative of the Westphalian nobility; after which he accompanied Count Stadion to St. Petersburg, and officiated as ambassador in Dresden (1801). As early as 1804 he had already obtained the reputation of the most refined of the Austrian diplomatists, and was sent

to Berlin in order to prevail upon the king of Prussia to join the new coalition against Napoleon. In 1806 he was selected for the mission at the court of the Tuileries. The French emperor received him with the remark: "You are very young to represent so powerful a monarchy." "Your majesty was not older at Austerlitz," replied Metternich. The historian Schlosser, in his narrative of that period, says: "It was a great gain to Austria that Metternich was sent as ambassador to Paris instead of the miserable Philipp Cobenzl, who had so scandalously suffered himself to be deceived in 1805, and had lulled the emperor of Austria into a ruinous security respecting the views, plans, and preparations of the French, till it was too late. The importance to which Metternich rose in public affairs was afterward very salutary for Austria, for to him indisputably belongs the glory, if it be a glory, of being in some measure a match for Talleyrand." In 1807 he concluded at Fontainebleau the convention by which Braunau was restored to Austria, and the Isonzo river made the boundary of Italy. In 1809, on the outbreak of the war between Austria and France, Metternich had some difficulty in obtaining his passports, and was only enabled to leave shortly before the battle of Wagram (July 5 and 6). He joined the emperor Francis in Hungary, and was appointed to succeed Count Stadion as minister of foreign affairs. In 1810 he conducted the negotiations with Champigny in regard to the marriage of the French emperor with the Austrian archduchess, and subsequently escorted Maria Louisa to Paris. Metternich, however, never ceased to watch the ambitious designs of Napoleon, and kept himself in constant communication with the English and Russian governments. Napoleon, smarting under his great reverses in Russia, and embittered by what he called the intrigues of Metternich and Stadion, openly accused the former in his interview with him in Dresden (June 27, 1813) of conspiring against him, while professing to conclude with him a treaty of peace; he even went so far as to ask him how much he had received from England for his treacherous conduct, at which remark Metternich grew pale. Fain, in his "Manuscript of 1818," gives a graphic account of this interview. In the excitement of the conversation, Napoleon's hat was dropped, but he was compelled to pick it up himself, Metternich passing it several times in walking up and down the room, without noticing it, as he would have done on all other occasions. Schlosser says: "Napoleon, however, immediately repented having forgotten himself in so inexcusable a manner toward the representative of his father-in-law, having laid himself so open, and having mortally offended this Jesuitical courtier." Metternich, on the other hand, entirely succeeded in his object, and on the night of the very same day when he made his hypocritical proposals of peace to Napoleon, a formal treaty was concluded at Reichenbach, signed by Stadion, Nes-

selrode, and Hardenberg, by which Austria engaged to declare war against France, in case the conditions which were to be proposed at Prague should not be accepted. This treaty was for a long time kept secret. The formal declaration of war by Austria against France was drawn up by Metternich's order, probably by Gentz (Aug. 11), and the quadruple alliance was concluded by him at Töplitz, Sept. 9. Metternich's great influence in this war soon became apparent. The kings of Bavaria and Württemberg were induced to forsake Napoleon by a secret provision made through Metternich that they should be protected against popular disturbances, and should receive additional possessions. Metternich was rewarded by the Austrian emperor for his zeal by the hereditary dignity of a prince of the empire, which was conferred on him on the eve of the memorable battle of Leipsic. He took a leading part in all subsequent conferences and treaties. To Napoleon's proposal of an armistice (Jan. 19, 1814), which he dictated to La Bessardière in a special letter to Metternich, the Austrian minister replied on Jan. 29, that "he was convinced it would not lead to any thing." The French emperor ridiculed this letter, and said: "Metternich fancies he controls the destinies of Europe, while he is under the control of all the other powers." When the congress of Vienna was opened, he was unanimously chosen to preside over its deliberations; and from that time until the revolution of 1848 he exercised a remarkable ascendancy over the affairs of Austria and Europe. He was strenuously opposed to the French revolution of 1830. Being at Carlsbad with Count Nesselrode when the news of it reached him, he remarked to the French ambassador to Vienna: "The emperor holds in entire abhorrence that which has just taken place in France. His profound conviction is that the present order of things cannot last." After the death of Francis (1835) Metternich remained in possession of his office as chancellor and prime minister, and accompanied the new emperor Ferdinand, in Sept. 1835, to Töplitz and Prague, where an interview took place between that monarch and those of Russia and Prussia. In 1840 and 1841, during the complication of the oriental question, he exerted his influence in favor of the maintenance of peace abroad, while at home, by his iron rule, he prepared the way for the revolution which terminated his power (March 13, 1848). Barely escaping with his life from the exasperation of the people, he fled through Holland to England, where he remained till Nov. 1849. He next removed to Brussels, and in 1851 the reaction had progressed sufficiently to enable him to return to Vienna. On his way thither, he visited his estate on the Johannisberg, which had been presented to him by the emperor in 1816, but which during the revolutionary movements in Germany in 1848-'9 had been taken from his control. While there he received the visit of the king of Prus-

sia, and a similar honor was conferred upon him by the present emperor of Austria, who again visited the faithful servant of his dynasty almost immediately on his arrival in Vienna (June, 1851). Without resuming public office, he continued until his death to exercise great influence in political affairs, and is said to have advised the maintenance of the most absolute rule over the Austrian possessions in Italy. He died about a fortnight before the battle of Solferino. The prince was fond of letters and art; and in his letters to Alexander von Humboldt, for whom he entertained a high regard and admiration, he remarks that he had missed his vocation, and that his inclination would have led him rather to the sphere of science than to that of diplomacy. In addition to his Austrian titles, he had been created by the king of Naples duke of Portella, with a pension of 60,000 Neapolitan ducats, had also been made a Spanish duke, and honors and presents had been showered upon him by all European potentates. His first wife died in 1825, having borne him two daughters—Leontine, married in 1835 to Count Maurice Sándor, and Herminie, honorary canoness of the chapter of the ladies of Savoy of Vienna. His second wife, whom he married in 1827, the beautiful baroness of Leykam, who was made countess of Beilstein, and who died in 1829, became the mother of his eldest son and heir, Richard, the present Prince Metternich, who married in 1856 a daughter of Count Sándor, and who, after officiating as ambassador in Dresden and as attaché to the ministry of foreign affairs during the war of 1859, became soon after the peace of Villafranca (July 11, 1859) ambassador at the court of Napoleon III. By his third wife, Countess Melanie of Zichy-Ferraris, whom he married in 1831, and who died in 1854, Metternich had a daughter, Melanie, who married in 1853 Count Joseph Zichy, and two sons, Paul and Lothar, the elder of whom is an officer in the Austrian army.

METTRAI, a French village, 5 m. from Tours, containing a celebrated establishment for the reformation of juvenile offenders, supported by voluntary donations and annual subscriptions, in which, since its foundation in 1839, over 2,000 children have been trained, chiefly by agricultural labor. Lord Brougham has called it one of the glories of France. (See *DEMETZ*, *FRÉDÉRIC AUGUSTE*, vol. vi. p. 861.)

METZ, a fortified city of France, capital of the department of Moselle, at the confluence of the Seille and Moselle, 245 m. E. by N. from Paris; pop. of the *arrondissement* in 1856, 178,465, and of the city, 44,176, exclusive of the garrison of 10,000 men. It is one of the strongest fortresses of France, ranking next after Strasbourg. The city is surrounded by a regular system of fortifications, and entered by 9 gates furnished with drawbridges. The most important works, which were commenced by Vauban and Belle-Isle and completed by Cormontaigne, are the fort of Belle-Croix, commanding the E. part of the city from the *Porte des Allemands*

to the river; the fort of *La Double Couronne*, protecting the southern part; and the *Redoute du Pâté*, which forms an island connected with the interior of the city by a subterranean gallery. The esplanade in the centre of the city is a beautiful promenade; the quarter on the right side of the Moselle contains many steep and narrow streets. Among the principal public buildings are the arsenal, containing upward of 80,000 muskets; the cathedral; the church of *Notre Dame de la Ronde* and of the abbey of *St. Vincent*, both religious edifices of great antiquity; the military hospital, the hall of justice, and the public library. Beside many Roman Catholic churches and convents, it contains a Calvinist church and several synagogues. It has also a celebrated artillery and engineering school. The *arrondissement* has manufactories of woollen goods, hosiery, plush, embroidery, beer, tiles, nails, &c., the annual value of the products of which amounts to nearly \$2,000,000.—Metz is of great antiquity, and was known to the Romans under the name of *Divodorum*, changed subsequently to that of *Mediomatrici*, having been the capital of that portion of *Belgic Gaul*; in the 5th century it was called *Mettis* or *Metis*. It became celebrated as the capital of *Austrasia*, which was afterward called the kingdom of Metz, and which in the middle of the 9th century assumed the name of *Lorraine*. In the early part of the 10th century Metz fell into the power of Henry the Fowler of Germany, but recovered its independence in the 11th, and became famous for its commerce with Germany, its brilliant society, and its love of letters and art. In 1552 it was united with France.

METZU, **GABRIEL**, a Dutch painter, born in Leyden in 1615, died there in 1658, or according to some authorities in 1669. In his youth he established himself in Amsterdam, where he rose to eminence as a *genre* painter. In his pictures the mere imitation of nature is carried to perfection. In drawing and perspective he was unsurpassed, as also in harmonious tone, in richness of color, and in *chiaroscuro*. He painted a few portraits, including one of Admiral Van Tromp now in the Louvre. His pictures are rare out of Holland, and bring very high prices.

MEULEN, **ANTOINE FRANÇOIS VAN DER**, a French artist, born in Brussels in 1684, died in Paris in 1690. In early youth he became a pupil of Peter Snayers, a painter of battles, and his own efforts in this department of the art recommended him to Le Brun, then the chief authority in art criticism in Paris, by whose suggestion he was invited thither to paint campaign scenes in the life of Louis XIV. He passed the remainder of his life in Paris, where he was highly esteemed not merely as a painter of battles, but of hunting scenes, *cavalcades*, and the like. One of his finest series of battle pieces is that formerly kept in the chateau of Marly representing the campaigns of Louis in Flanders.

MEURSIUS, or **DE MEUSE**, **JOHANNES**, the

elder, a Dutch scholar and antiquary, born in Lordun, near the Hague, in 1579, died in Sorøe, Denmark, Sept. 20, 1639. He was appointed tutor to the sons of the grand pensionary Barneveldt, and accompanied them to the principal courts of Europe. In 1610 he was made professor of history at Leyden, and in the following year professor of Greek. Subsequently the states of Holland conferred on him the title of historiographer, and many other honors; but on the execution of his patron Barneveldt, he was subjected to persecution, and in 1625 accepted the appointment of professor of history in the university of Sorøe. He wrote numerous monographs on Greek and Roman antiquities, reprinted in great part in the *Thesaurus* of Graevius and Gronovius (18 vols. fol., Leyden, 1697-1702); *Res Belgica* (1612); *Glossarium Græco-Barbarum* (1614); and *Historia Danica* (Copenhagen, 1630). His collected works fill 12 volumes folio (Florence, 1741-'68).

MEURTHE, a N. E. department of France, in the old province of Lorraine, bounded N. by Moselle, E. by Bas-Rhin, S. by Vosges, and W. by Meuse; area, 2,858 sq. m.; pop. in 1856, 424,873. It is remarkable for the beauty of its scenery, the fertility of its soil, and the variety of its productions. The surface is diversified and covered to a great extent with dense forests. The principal mountains are the Vosges, which range along the E. frontier. The chief rivers are the Meurthe, Moselle, Seille, and Sarre.

MEUSE, a N. E. department of France, in the old province of Lorraine, bounded N. by Ardennes and Luxemburg, E. by Moselle and Meurthe, S. by Vosges, and W. by Haute-Marne, Marne, and Ardennes; area, 2,405 sq. m.; pop. in 1856, 305,727. The Faucilles mountains traverse it from S. E. to N. W., and send off numerous ramifications. The chief rivers are the Meuse, Aisne, Aire, and Orne. Cotton and iron are manufactured. Capital, Bar-le-Duc.

MEUSE (anc. *Mosa*; Dutch, *Maas*; Fl. *Maese*), a river which rises in the department of Haute-Marne in France, and, flowing N. through those of Vosges, Meuse, and Ardennes, enters Belgium near Charlemont. At Namur it changes its course toward the N. E., which direction it keeps till near its entrance into Holland, when it bends again toward the N., then flows N. W., and finally W. A little below Gorkum it divides into two branches, one of which takes the name of Merwe, and, after again dividing and forming with its arms the island of Ysselmonde, falls into the German ocean amid shoals and quicksands; while the other branch, which flows more to the S., and likewise subdivides into two smaller streams, discharges its waters by these channels into different parts of the same sea. The delta of the Meuse is larger than that of any other European river. Its principal tributaries are, in France, the Mouzon, the Vair, and the Othiers; in Belgium, the Sambre, the Lesse, and the Ourthe; in Holland, the Waal, the

Leck, and the Yssel. The chief cities on its banks are Verdun, Sedan, and Charlemont, in France; Namur and Liège, in Belgium; Maastricht, Willemstadt, and Rotterdam, in Holland. The length of the river is over 550 m., and it is navigable to Verdun, 480 m. from the sea.

MEW, or SEA Mew, a name given in Great Britain to some of the smaller gulls, and especially to the common European species (*Larus canus*, Linn.), called also winter mew.

MEXIAS, one of the channels by which the Ogobay river of central Africa reaches the ocean, 56 m. S. of the equator, in long. 8° 47' E. It was formerly supposed to be an independent river, but the explorations of M. Du Chaillu have shown that it communicates by innumerable offsets not only with the Ogobay, but also with Nazareth and Fernand-Vaz rivers. It is narrow, but during the rainy season discharges such a volume of water that the current is felt for several miles out to sea, and it is sometimes fresh at its mouth at high tide. (See OGOBAY.)

MEXICAN PICTURE WRITING, a name given to a system of hieroglyphics in use among the semi-civilized nations of Central America and Mexico, previous to the discovery of America by Columbus. Careful recent investigations have shown that no single term can adequately characterize the system, or rather systems (for there was more than one), and that among the nations which anciently had their seat near Palenque, there existed a probably pure hieroglyphical system; while among the nations of Mexico, in the valley of Anahuac, as also among the affiliated families of San Salvador and Nicaragua, a less perfect or mixed system prevailed, which was composed of condensed pictures, and conventional or derivative representations of things, having a hieroglyphical character and a clear phonetic value. The capacity of even this less perfect or mixed system was considerable. By means of it the Mexicans compendiously recorded their history, composed their rituals and civil and religious calendars, recorded titles to property and the judgments of courts, assessed taxes or tribute, defined genealogies, &c. When Cortes landed, full accounts of him, his men, equipments, and, so far as he indicated them by word or action, of his purposes, were thus recorded and sent to Montezuma. The Spaniards were not a little surprised at the capacity of a system of representation obviously so imperfect; and the ecclesiastics who followed in the train of the conquering army, animated by a zeal not surpassed by the martial spirit of the military chiefs, readily conceived the purpose of using this system among nations whom it would have been a hopeless task to attempt to instruct in the Spanish language and alphabet. All the influential part of the native population in Mexico, the officers of the empire and the entire sacerdotal body, were thoroughly instructed in their hieroglyphical system; and the Catholic propagandists used their utmost exertions to acquaint themselves with it, and adapt it to the purpose of convert-

ing the natives. The first attempt in this direction, or perhaps the first use of pictorial representations, out of which this adaptation gradually grew, was within 8 or 9 years after the capture of Mexico, by Testera of Bayonne, brother of the chamberlain of Francis I. According to the historian Torquemada, "not being able to learn the language of the Indians as quickly as he wished, and impatient of delay, he adopted a new mode of preaching by means of an interpreter, taking with him the mysteries of the faith painted on a cloth, which the interpreters explained to the Indians as directed by the servant of the Lord. And thus he converted vast numbers, availing himself greatly of the representations or pictures which he carried with him." Testera afterward became commissary-general of the Indies, and his followers, the celebrated Sahagun, Motolinia, and Peter of Ghent, as also the Franciscans generally, adopted his example of using pictures, more or less borrowed from the Mexicans, in their teachings. In the provinces near Mexico, as soon as the Franciscans commenced this adaptation, the interpreters, and numbers of the natives employed as missionaries, lent themselves to extend its scope; and Motolinia in his MS. informs us that he was literally overwhelmed with Indians who presented their confessions to him in figures or paintings after their mode of representation. Valdez in 1579, and Torquemada nearly a century after the conquest, received similar confessions; indeed, in their time, this system of recording confessions was preferred to alphabetical writing, even by Indians who were perfectly well versed in the latter. And there still exist, in the museum of Mexico, as elsewhere, several kinds of catechetical compositions, under a more or less advanced adaptation of the native system, some of them approaching so nearly to absolute native originals, dating beyond the conquest, as only to be distinguished from them by the materials on which they are painted. They exist of all dates, from the arrival of Testera in 1529 up to 1600, the time when Juan Baptista, still making use of the paintings, wrote his work entitled "Hieroglyphics of Conversation, in which, by means of paint and figures, the natives are taught to desire heaven."—Many manuscripts or paintings, having their origin with the early priests and missionaries, and some of them even painted on paper of the magney, such as was in use before the discovery, have found their way to Europe, and into private and public collections, where they have been confounded with the paintings and manuscripts of true Mexican origin, and of earlier date. Of course, we cannot be surprised to find in this class of MSS. those confirmations of Christian doctrine and the Hebrew Scriptures, allusions to the creation, the fall, the deluge, and the birth and death of Christ, which have so profoundly impressed the minds of superficial investigators, and which have been variously adduced in support of the hypothesis of the

unity of the human race, descent of the American aborigines from Asiatic or Jewish tribes, a universal primitive religion, &c. They have led also to equally erroneous conclusions in the minds of inquirers equally superficial, but with different preoccupations, who rashly condemn all the Mexican MSS. in existence as monkish impostures, and of a date subsequent to the Spanish conquest. The truth however is, that there is a certain number of paintings and MSS. in existence, of undoubted aboriginal origin, historical and ritual in character, and dating back beyond the discovery of the continent. Some of the historical MSS. were continued in the spirit and style of the ancient system, by competent native hands, after the conquest, and contain the Indian version of that event. There are others of equally unquestionable ancient date, but generally of a religious or mythological character, which there is reason to believe have been changed in copies, or altered in the originals, with a view to conform with priestly teachings, and illustrate the dogmas of the church. And finally there is that large class of MSS., originating with Testera, and perfected by his followers, which have already been described. This latter class have a special value, inasmuch as we may reach through the various stages of their development, and their gradual approximation to the true Mexican system, with which it must have been the aim of their authors to make them exactly conform, the principles of that aboriginal system, and the rules of its application. Under this view they merit a fuller notice and explanation. They seem to have been of three kinds: 1, those of Testera and the early Franciscans, which were simple paintings, more or less adapted to Indian conventionalisms in their style of execution; 2, those of a mixed kind, in which some simple paintings were preserved, largely illustrated by arbitrary native and other figures, which for lack of a better term might be called hieroglyphics; and 3, those in phonetic characters or representations, forming a complete adaptation of the Mexican system. The mixed MSS. were only those of Testera, touched up by the natives, with proper and other names in phonetic rebuses, with sometimes a sign illustrating the action represented in the painting. The proper manner in which these paintings should be made led to serious quarrels among the monastic orders. One of these MSS. belonging to M. Aubin of Paris (who has made the graphic system of the Mexicans a special study, and with singular success), bears the name and is annotated by Sahagun. It was also in possession of the unfortunate Boturini, who describes it as consisting of "eleven leaves in figures and ciphers, by the Fray Bernardino de Sahagun; a very curious thing, by means of which the Indians learned with ease the mysteries of our faith." The 8d class of Christian or post-Mexican paintings were phonetic, and are correctly described by Torquemada, who, according to Ixtlilxochitl, was the first who suc-

ceeded in interpreting the pictures and poems of the Indians. After speaking of the mode in which some Indians learned the *Pater Noster*, he adds: "Others changed the Latin into words in their own language which resembled them in sound, representing them not by letters but by the things themselves signified; for they had no letters except pictures, and it was by them that they understood each other. This will be more clear by an example. The word in their language most nearly representing *Pater* being *pantli*, the name of a kind of small flag, they put this flag for *Pater*. In place of *noster*, a word resembling their *nochtli*, they paint a *tuna* (cactus) fig, the name of which, *nochtli*, recalls the Latin *noster*; and so they go on to the end of the prayer. By a similar process and like characters they wrote down what they wished to learn by heart. This was during the first period of their conversion, for now (between 1592 and 1614) they no longer require to use these ancient characters." This passage, which gives the true key to the Mexican writing, accords with what he elsewhere says of a class of Totonac monks who were employed "to put in good style and to write in figures the discourses which the aboriginal pontiffs pronounced in public." Sahagun and other authors also assure us that the ancients had school books "containing poems in the ancient characters." In some of the paintings designed to record the Lord's prayer, the representation of two altars stands for daily bread. Now, daily bread rendered literally in Nahuatl or Mexican is *momoxtlae*, while an altar in the same language is *momoxtli*. In other paintings the same phrase or term is represented by the figure of a roll of bread and the sun—a sun among the Indians being equivalent to a day. We even find Spanish phoneticism in paintings of this kind. Thus in the title *Ave Maria*, we observe a bird, *ave* in Spanish, standing for its first part. Phonetic signs were sometimes sustained through whole prayers, without the slightest resort to ideography; and this fact gives us some idea of the capabilities of the pure Mexican system. Such is the case with a *Pater Noster* preserved in the museum of Mexico, which throws great light on the ancient paintings. The manner in which the title, *Pater Noster*, is rendered, may serve to illustrate the whole:



(*Pa-te nocht-te, or Pa-tell nocht-tell*.)

First is the figure of a little flag, or *pantli* in Nahuatl, the root of which is *pan* or *pa*; second is the sign of stone, *tell*, root *te*, the whole making syllabically *Pa-te* for *Pater*, the *r* being wanting in the Mexican language. Next we have the sign of the fruit of the cactus, *nochtli*, root *nocht*, and that of stone, *tell*, root *te*, as before, making *nocht-te* for *noster*. The whole is therefore the nearest possible approach to the

Latin, represented by Mexican figures of exact and unmistakable phonetic value. A general comparison of the ancient and positively Mexican paintings leaves no doubt that this mode of representation, by syllabic phonetics, in which the roots of words only were to be understood by the figures or sounded in reading, was the mode universally accepted, more or less mixed up with ideographic signs and simple pictures. —Most of the Mexican MSS. which have been preserved belong to that class of mixed compositions which borrow the aid of writing and drawing, similar to our geographical charts, our plans, and certain engravings with legends, in which the figures and places are accompanied by their proper names, and sometimes by an explanatory text. In general, on a ground or in a topographical frame, at the side, above, or in the middle of compartments indicating the year, and sometimes the day, the paintings display the principal events intended to be recorded, represented in a conventional style; as, for example, the head in profile, and the eye turned toward the spectator; men in reddish brown, and women in yellow, &c.—particulars which we find among the Egyptians. Behind the bust or head of a man, or on the generic symbol of town or village, figurative signs express the name of the person or place. In these figurative signs consists for the most part what is called Mexican writing. These are the symbols which Humboldt recognizes as "capable of being read," and which "consisted in joining together signs which stood for sounds." The rest of the picture is usually composed of chronological signs, of easily determinable value, and of a topography and iconography frequently very rude, among which we should as little look for Mexican art as for that of Raphael in our heraldic figures or playing cards.—In the historical and administrative documents of a superior order, the figurative writing, constantly phonetic, is no longer ideographic except in rare instances where the phonetic system fails. But it by no means follows that the same records should be alike, or in other words, that different paintings relating the same history should coincide in their signs, even when phonetically exactly alike. For instance, the name of Itzcoatl, the 4th king of Mexico, is expressed in some of the MSS. by the figure of a serpent (*coatli*), with its back crested with knives or arrow heads of obsidian (*iteli*); the whole, *Itzcoatl*. In other paintings, however, it is written syllabically as follows: figure of an arrow head, *iteli*, root *ite*; figure of a vase, *comitli*, root *co*; figure or sign of water, *atl*; the whole, *Itz-co-atl*. The documents of this class, in which the syllabic writing predominates, are generally land registers, tribute rolls, judgments of courts, genealogies, &c., and were continued long after the conquest, and for the use of the Spanish administrations were often accompanied by literal translations from which alone a very full dictionary of the Mexican signs might be constructed. In numeration and chronology the Mexican system was

exact and ample. Most of the historical paintings are simple annals, but some give more specific dates, down to the day of the month on which the event recorded took place. The most striking and to the uneducated eye the most interesting of the Mexican paintings are the ritual calendars, and schemes of judicial astrology, which make up the greater part of Lord Kingsborough's published collection. Excepting the designations of the days, these seem to be purely figurative or symbolical, intended only for the use of the priests and diviners, and possessed of an esoteric significance. They are valuable only in connection with the study of Mexican mythology and the Aztec religion and superstitions.—And here it may be observed, that although all the painted historical records and civil and ritual calendars on skins or paper of the maguey which have been brought from the tropical regions of this continent, are loosely called Mexican, yet there is a wide distinction to be drawn between those found in Mexico and those obtained in Central America. Of the latter unfortunately but few examples are known to exist. The so called Dresden MS., published by Lord Kingsborough, is perhaps the only perfect example of this kind in Europe. Its figures and signs coincide with those sculptured on the monuments of Palenque, Yucatan, and Copan, and identify it as the work of the same people. It has but slight resemblance to the Mexican MSS. already discussed, and seems to mark a far higher development of the graphic art. So far as they can be made out, the elements of the Central American or Toltec system were few and very exact in their application, not admitting of that variation which would naturally result from the caprice or varying individual conceptions and tastes of those working under the system of Mexico. We discover in it no proper representations of things, except as pictures illustrative of what may be called the text of the MS. in which they are used, or in miniature in the text when employed as signs or characters, having a fixed and constant value, or modified only by the addition of arbitrary signs, like the points in oriental writings. It is undoubted that such MSS. as that of Dresden were in common use in all parts of Central America occupied by the Tzendal or Toltec stock at the time of the discovery, and that the existing aboriginal population of that country is chiefly made up of the descendants of the authors of the system then in use, who were equally the builders of the monuments to which unritual investigators would assign a foreign origin and high antiquity. If so, then, as the hieroglyphics of Egypt could only be interpreted through the Coptic, the modern form of the ancient Egyptian tongue, so the hieroglyphics of Central America can only be made intelligible, and their phonetic value obtained, through the medium of the Maya, Quiché, Kachiquel, and other existing languages, themselves only dialects of a common mother tongue, to which has been given the name of Tzendal.

The Mexican system seems to have been intermediate between the rude picture records and mnemonic symbolism of the North American Indians, and the hieroglyphical and probably purely phonetic system of Central America, but at the same time of higher development and capacity than that of New Granada and Peru. It was evidently in an infant but progressive state at the time of the conquest.

MEXICO, a federal republic in North America, extending from lat. 15° to 32° N., and from long. 86° to 117° W., bounded by the United States, the gulf of Mexico, the Caribbean sea, which washes part of Yucatan, the British territory of Baliza, the Central American republic of Guatemala, and the Pacific ocean. The dividing line between the United States and Mexico, according to the treaty of Dec. 30, 1853, known as the Mesilla or Gadsden treaty, is as follows: "Beginning in the gulf of Mexico, three leagues from land, opposite the mouth of the Rio Grande, as provided in the 5th article of the treaty of Guadalupe Hidalgo, thence, as defined in said article, up the middle of that river, to the point where the parallel of $31^{\circ} 47'$ N. latitude crosses the same; thence due W. 100 miles; thence S. to the parallel of $31^{\circ} 20'$ N. latitude; thence along the said parallel of $31^{\circ} 20'$ to the 111th meridian of longitude W. of Greenwich; thence in a straight line to a point on the Colorado river 20 English miles below the junction of the Gila and Colorado rivers; thence up the middle of said river Colorado until it intersects the present line between the United States and Mexico," and thence to the Pacific by the line separating the two Californias, which, as laid down in the treaty of Guadalupe, is as follows: "A straight line drawn from the middle of the Rio Gila, where it unites with the Colorado, to a point on the coast of the Pacific ocean, distant one marine league due S. of the southernmost point of the port of San Diego, according to the plan of said port" attached to the treaty. The extreme length of the republic, N. W. and S. E., measured on a straight line from the southern extremity of the state of Chiapa to the northern limit of Lower California, within one league of the bay of San Diego, is upward of 2,000 m.; and its extreme breadth, in lat. 26° N., over 1,100 m. Its coasts extend over 1,600 m. on the gulf of Mexico and the Caribbean sea, and upward of 4,200 m. on the Pacific ocean and the gulf of California. Its N. frontier is 1,792 m. in length, and its southern 532 m.; and its breadth at Tehuantepec is 130 m. Before the treaty of Guadalupe Hidalgo, and the Mesilla or Gadsden treaty, Mexico comprised an area of 1,690,317 sq. m.; but, by the first mentioned treaty, her territory was reduced 897,650 sq. m., and in pursuance of the second 26,185; leaving its present total area 766,482 sq. m.—The republic of Mexico is divided, under the constitution of 1857, into 23 states, one district, and one territory. The population is stated by the latest Mexican authorities to be 8,283,088, distributed as follows:

| States. | Area in square miles. | Population. | Average population to square mile. | Capitals of States. | Population of Capitals. |
|------------------------------------|-----------------------|-------------|------------------------------------|------------------------|-------------------------|
| Agua Calientes..... | 2,647 | 58,843 | 31.44 | Agua Calientes..... | 20,000 |
| Chiapas..... | 15,051 | 161,914 | 8.96 | San Cristobal..... | 7,559 |
| Chihuahua..... | 80,701 | 160,000 | 1.98 | Chihuahua..... | 19,000 |
| Colima..... | 2,918 | 61,243 | 20.98 | Colima..... | 31,774 |
| Durango..... | 46,537 | 156,519 | 3.34 | Durango..... | 13,449 |
| Guanajuato..... | 14,035 | 929,481 | 66.22 | Guanajuato..... | 68,898 |
| Guerrero..... | 80,926 | 270,000 | 3.78 | Tixtla..... | 6,500 |
| Jalisco..... | 46,945 | 804,068 | 17.12 | Guadalajara..... | 68,000 |
| Mexico..... | 18,851 | 1,012,554 | 58.69 | Toluca..... | 12,000 |
| Michoacan..... | 23,220 | 491,679 | 23.12 | Morelia..... | 25,000 |
| Nuevo Leon y Coahuila..... | 70,798 | 212,459 | 3.00 | Monterey..... | 18,584 |
| Oajaca..... | 84,343 | 581,962 | 16.64 | Oajaca..... | 25,000 |
| Puebla..... | 8,581 | 665,623 | 78.40 | Puebla..... | 78,000 |
| Queretaro..... | 1,820 | 180,000 | 98.90 | Queretaro..... | 47,570 |
| San Luis Potosi..... | 27,194 | 890,860 | 14.35 | San Luis Potosi..... | 83,581 |
| Sinaloa..... | 82,586 | 160,000 | 4.91 | Culiacan..... | 10,000 |
| Sonora..... | 86,365 | 147,138 | 1.69 | Ures..... | 7,000 |
| Tamaulipas..... | 29,314 | 108,514 | 3.70 | Ciudad Victoria..... | 8,164 |
| Tabasco..... | 18,996 | 75,901 | 3.99 | San Juan Bautista..... | 5,500 |
| Tlaxcala..... | 1,913 | 80,171 | 41.79 | Tlaxcala..... | 3,468 |
| Vera Cruz..... | 26,493 | 888,859 | 12.79 | Vera Cruz..... | 9,647 |
| Yucatan..... | 47,328 | 680,825 | 14.39 | Merida..... | 22,575 |
| Zacatecas..... | 26,593 | 802,141 | 11.26 | Zacatecas..... | 15,427 |
| Territory of Lower California..... | 58,620 | 9,000 | .15 | La Paz..... | 500 |
| District of Mexico..... | 87 | 280,000 | 2,643.67 | Mexico..... | 200,000 |
| Total..... | 766,482 | 8,263,068 | 10.80 | | 734,742 |

In the aggregate, the frontier states have but 637,106 inhabitants, and, including Sinaloa and Durango, their population is only 953,625; yet these six states and one territory have an area of 400,000 sq. m., or more than one half of the entire Mexican republic. The population may be classified as follows: of pure European blood, $\frac{1}{3}$, or 1,656,620; of the native or indigenous race, $\frac{1}{3}$, or 2,208,824; of mixed European and indigenous blood, $\frac{1}{3}$, or 4,417,644. On an average the annual increase of the population of the republic may be estimated at 144,000.—The sea coast of Mexico is irregular, and deeply indented by numerous bays and gulfs. Its geological structure is peculiar. The great Cordillera of the Andes, which traverses the whole of South America from its southernmost limit, is exceedingly depressed at the isthmus of Panama, and again at Tehuantepec, where it serves merely to form a barrier between the Pacific and Atlantic. But, as soon as this massive chain enters the broader portion of North America, it divides into two gigantic arms, one to the E. and along the shores of the gulf, and the other to the W. along the shores of the Pacific, which support between them a continuous lofty platform or table-land, crossed and intersected by innumerable sierras, some of which rise to the height of 17,000 feet above the level of the sea. This table-land extends from the isthmus of Tehuantepec as far N. as lat. 42°, and, narrow at the S., expands toward the N. W. till about the latitude of the city of Mexico, where it attains its greatest breadth of 360 m.; and there also it is the highest. It is generally level, except where detached mountains occur, and its S. part is divided into 4 portions or distinct plateaus, surrounded by hills from 500 to 1,000 feet high. In one of these, the plain of Tenochtitlan, surrounded by a wall of porphyritic mountains, stands the city of Mexico. On the E. side the table-land declines, until, at the Rio Grande, on entering Texas, it has reached the

level of that river; and on the N. toward El Paso, and along the frontier of Chihuahua and Sonora, its general elevation has become only some 3,000 to 4,000 feet. The following lines of elevation will illustrate the peculiar topography of Mexico:

LINE FROM VERA CRUZ TO EL PASO.

| Places. | Altitudes. |
|--------------------------|------------|
| Vera Cruz..... | 4,050 |
| Orizaba..... | 7,640 |
| Summit..... | 7,370 |
| San Agustin..... | 7,200 |
| Puebla..... | 7,500 |
| Mexico..... | 6,780 |
| Toluca..... | 6,490 |
| San Juan del Rio..... | 6,360 |
| Queretaro..... | 6,020 |
| Celaya..... | 5,760 |
| Salamanca..... | 5,940 |
| Guanajuato..... | 5,910 |
| Silao..... | 6,180 |
| Leon de Aldamas..... | 6,880 |
| Lagos..... | 6,280 |
| Agua Calientes..... | 6,090 |
| San Luis Potosi..... | 8,040 |
| Zacatecas..... | 7,240 |
| Fresnillo..... | 6,850 |
| Durango..... | 4,990 |
| Parras..... | 5,240 |
| Saltillo..... | 3,790 |
| El Bolson de Mapimi..... | 4,640 |
| Chihuahua..... | 3,810 |
| El Paso del Norte..... | |

FROM DURANGO TO RIO GRANDE.

| Places. | Altitudes. |
|----------------|------------|
| Durango..... | 6,850 |
| Saltillo..... | 5,240 |
| Rinconada..... | 3,880 |
| Monterey..... | 1,690 |
| Marfa..... | 1,854 |
| Cerralvos..... | 1,006 |
| Mier..... | 417 |
| Camargo..... | 423 |
| Reynosa..... | 104 |

MEXICO TO ACAPULCO.

| Places. | Altitudes. |
|--------------------------|------------|
| Mexico..... | 7,500 |
| Amecameca..... | 8,139 |
| Cuautla..... | 4,380 |
| Cuernavaca..... | 4,000 |
| Matamoros de Azucar..... | 8,409 |
| Mescala..... | 1,583 |
| Rio Papagayo..... | 1,000 |
| Acapulco..... | |

MINING LOCALITIES.

| Places. | Altitudes. |
|---------------------|------------|
| Guanajuato..... | 6,540 |
| Fresnillo..... | 7,240 |
| Zacatecas..... | 8,040 |
| Pachuca..... | 8,112 |
| Catorce..... | 8,788 |
| Real del Monte..... | 9,000 |

A remarkable series of active volcanoes occurs along a parallel about 16 m. S. of the city of Mexico. Tuxtla is the most eastern of them, near the Mexican gulf, next to which stands the snow-shrouded cone of Orizaba, with a crater which shines like a star in the night. Popocatepetl, the highest mountain in Mexico, lies still further W., and, with the peaks of Iztaccihuatl and Toluca, united by a chain of smaller volcanoes, forms a volcanic circle around the city of Mexico and its lake. On the W. slope of the table-land, about 70 m. from the Pacific, is the volcanic cone of Jorullo, which rose suddenly above the plain, on the night of Sept. 29, 1759, and is the highest of 6 mountains which have been thrown up in this part of the table-land since the middle of the last century. The cone

of Colima, the last of this series, stands insulated in the plain of that name, between the W. declivity of the plateau and the Pacific. The

following table shows the height above the sea of the principal mountains, those marked with an asterisk being volcanoes:

| Mountain. | States. | Elevation. | Mountains. | States. | Elevation. |
|-----------------------|----------------|------------|------------------------|----------------|------------|
| Popocatepetl* | Mexico..... | 17,716 ft. | Soconusco* | Chiapa..... | 7,874 ft. |
| Pico de Orizaba* | Vera Cruz..... | 17,372 | Jesus Maria..... | Chihuahua..... | 8,238 |
| Iztaccihuatl* | Mexico..... | 14,786 | Tabacotea..... | Do..... | 7,789 |
| Cofre de Perote..... | Vera Cruz..... | 13,410 | Cerro del Mercado..... | Durango..... | 7,923 |
| Nevado de Toluca..... | Mexico..... | 14,567 | Veta Grande..... | Zacatecas..... | 9,126 |
| Zempoalteatl..... | Oajaca..... | 11,141 | Buñ de Zacatecas..... | Do..... | 8,294 |
| Colima* | Jalisco..... | 12,084 | Jorullo* | Michoacan..... | 1,683 |
| Pico de Cuitzeo..... | Michoacan..... | 10,073 | Tuxtla..... | Vera Cruz..... | ..... |

—The rivers which flow through the Mexican territory are divided into three classes, viz.: those which flow into the Pacific ocean, those

which fall into the gulf of Mexico, and those which terminate in lakes and lagoons, as shown in the following table:

| Rivers. | States through which they flow. | Length in miles. | Termination. |
|-------------------|--|------------------|---------------------|
| Rio Grande..... | New Mexico, Chihuahua, Coahuila, and Tamaulipas..... | 1,427 | Gulf of Mexico. |
| Panuco..... | San Luis Potosi and Tamaulipas..... | 286 | Do. |
| Alvarado..... | Oajaca and Vera Cruz..... | 161 | Do. |
| Coatzacoalco..... | Tehuantepec..... | 145 | Do. |
| Grijalva..... | Chiapa and Tabasco..... | 244 | Do. |
| Usumacinta..... | Do..... | 341 | Do. |
| Rio Yaqui..... | Sonora..... | 357 | Gulf of California. |
| Rio Mayo..... | Do..... | 208 | Do. |
| Fuerte..... | Between Sonora and Sinaloa..... | 273 | Do. |
| Cullacan..... | Sinaloa..... | 156 | Do. |
| Mesquital..... | Durango and Jalisco..... | 299 | Pacific Ocean. |
| Santiago..... | Jalisco..... | 261 | Do. |
| Balsas..... | Mexico, Guerrero, and Michoacan..... | 419 | Do. |
| Ures..... | Sonora..... | 411 | Lake of Sonora. |
| Lerma..... | Mexico and Michoacan..... | 282 | Lake of Chapala. |

—Mexico is naturally divided into three regions, or superficial strata, viz., the *tierras calientes*, *tierras templadas*, and *tierras frias*. The *tierras calientes*, or hot lands, embrace chiefly that portion of the territory lying on the borders of the Atlantic and Pacific, and extend up the slope of the respective ranges to an elevation of between 8,000 and 4,000 feet. This division, however, is not confined exclusively to the coast, for it also includes such portions of the interior as do not exceed that elevation, and where there is heat and moisture enough to produce the fruits of the tropics. The *tierras templadas*, or temperate regions, comprise all that greater portion of the republic having an elevation of between 4,000 and 8,000 feet, embracing the whole of the vast plateau stretched between the mountains of the gulf and those of the Pacific slope. This is the characteristic region of Mexico, and includes within its limits all the great centres of population of the republic. The *tierras frias*, or cold lands, comprise the mountainous districts rising above the level of the *tierras templadas* up to the limit of constant snow. Between these elevations of 8,000 and 4,000 feet a considerable Indian population, hardy and independent, is to be found upon the sierras, and also many of the most extensive mining districts. Though Mexico extends into both the temperate and the torrid zones, its climate depends less upon latitude than upon elevation. In general, the republic, with the exception of the coast and a few other places, enjoys an even and temperate climate, free from the extremes of heat and cold, in consequence of which most of the hills in the cold regions are covered with trees, which never lose their

foliage, and often remind the traveller of the beautiful scenery of the valleys of Switzerland. In the *tierras calientes* we are struck by the groves of mimosas, liquid amber, palms, and other gigantic plants characteristic of tropical vegetation; and finally, in the *tierras templadas*, by the enormous haciendas, many of which are of such extent as to be lost to the sight in the horizon with which they blend. The Mexicans make two grand divisions of the 12 months into the “dry season” and the “rainy season.” The latter commences about June and lasts usually 4 months, and the dry season comprises the remainder of the year. The soil of Mexico, with the exception of a few tracts which are not sufficiently irrigated, is exuberantly fertile, and in some places the yield of maize is from 250 to 300 fold.—Mexico produces precious stones, as the ruby, amethyst, topaz, opal, garnets, agate, and chalcodony. The great wealth of the country, according to developments up to the present day, consists in its mines. It is true that the capital and labor, both foreign and domestic, employed there, have been chiefly devoted to the production of the precious metals; and, though under a new order of things agriculture and manufactures may receive greater attention, still the abundance of minerals is so great that its mines must always constitute the leading interest. The minerals of Mexico are silver, gold, copper, iron, zinc, lead, antimony, arsenic, sulphur, cobalt, &c. The mines of gold and silver only have been worked extensively, and silver forms the principal currency of the country and the great article of export. In treating of Mexico there is no subject so unsatisfactory or bewildering as

that which relates to the products of her mines. Humboldt, who wrote in 1808, gives some valuable statistics of mining operations in Mexico previous to that period. He states the total amount of silver raised from the Mexican mines from the conquest in 1521 to 1808, according to the official returns, at \$1,767,952,000; and adding one seventh for unregistered silver, he makes the grand total \$2,027,952,000. Ward gives the total coinage from 1788 to 1826, according to government returns, as \$1,438,658,611. A writer in "Hunt's Merchant's Magazine" (New York, Aug. 1858) estimates the total product of the Mexican mines from the conquest of Cortes to the present time at nearly \$12,000,000,000. The ancient Mexicans, properly speaking, had no coin. The conquerors introduced it, and coining dates from the building of a mint in the city of Mexico in 1535. For many years after the invasion pieces of gold and silver were stamped by officials of the crown, which constituted them a circulating medium.

The coinage of money in Mexico presents two great epochs: first, from the establishment of a mint in the city of Mexico up to the independence; and second, from the independence to the present date. The first period affords three subdivisions, viz.: *moneda macuquina*, or irregular coins; *moneda columnaria*, or pillar coin; and *moneda de busto*, or bust coin. The first was so called owing to its irregular form and weight, and was stamped by means of a hammer, with a cross, two lions, and two columns on one side, and on the reverse with the name of the reigning king. The second received the name of "pillar" from presenting on one side the arms of Spain, supported by the pillars of Hercules. This was the first coin struck in the mint according to the rules of art. The third, or "bust coin," bears the effigy of the last king who ruled Mexico. The following statement of the coinage of Mexico, from the conquest down to and including the year 1856, is from official data furnished by the *ministerio de fomento*:

| Mints. | Silver. | Gold. | Copper. | Total. |
|------------------------|-----------------|--------------|-------------|-----------------|
| Mexico | \$2,120,000,200 | \$75,447,420 | \$6,400,705 | \$2,211,848,404 |
| Chihuahua..... | 10,503,207 | 950,992 | 50,420 | 11,504,619 |
| Culiacan..... | 7,037,500 | 2,604,410 | .... | 9,641,910 |
| Durango..... | 20,541,967 | 2,531,916 | .... | 23,073,883 |
| Guadalajara..... | 25,056,758 | 651,317 | 22,000 | 25,730,075 |
| Guadalupe y Calvo..... | 2,023,958 | 2,311,104 | .... | 4,335,062 |
| Guanajuato..... | 172,636,826 | 10,954,830 | .... | 183,591,656 |
| San Luis Potosi..... | 87,302,301 | .... | 20,527 | 87,322,828 |
| Sombrerete..... | 1,551,940 | .... | .... | 1,551,940 |
| Tlalpan..... | 950,110 | 208,544 | .... | 1,158,654 |
| Zacatecas..... | 107,900,403 | .... | 107,840 | 108,008,243 |
| Total..... | \$2,534,115,879 | \$94,209,542 | \$6,737,725 | \$2,635,063,146 |

The yearly coinage of the mints of Mexico increased in steady progression from the time of the establishment of the first mint up to the year 1805, when the highest amount was reached, being for that year \$27,000,000. The total coinage of the mints of Mexico from the war of independence to 1856 is as follows:

| | | | | |
|-----------|-----|----|------------|---------------|
| 1812..... | \$1 | 28 | 1840..... | \$12,182,567 |
| 1813..... | 1 | 64 | 1841..... | 12,475,632 |
| 1814..... | 1 | 72 | 1842..... | 12,800,300 |
| 1815..... | 1 | 58 | 1843..... | 12,078,000 |
| 1816..... | 1 | 71 | 1844..... | 12,671,230 |
| 1817..... | 1 | 61 | 1845..... | 12,220,717 |
| 1818..... | 1 | 66 | 1846..... | 12,414,443 |
| 1819..... | 1 | 83 | 1847..... | 17,030,115 |
| 1820..... | 1 | 71 | 1848..... | 19,203,663 |
| 1821..... | 1 | 90 | 1849..... | 19,286,579 |
| 1822..... | 1 | 60 | 1850..... | 19,280,230 |
| 1823..... | 1 | 70 | 1851..... | 17,481,934 |
| 1824..... | 1 | 45 | 1852..... | 18,190,514 |
| 1825..... | 1 | 67 | 1853..... | 17,028,921 |
| 1826..... | 1 | 63 | 1854..... | 17,249,948 |
| 1827..... | 1 | 69 | 1855..... | 17,503,478 |
| 1828..... | 1 | 67 | 1856..... | 19,205,650 |
| 1829..... | 1 | 66 | Total..... | \$478,392,014 |

The following is the coinage of the different mints of Mexico in the years 1855 and 1856:

| In 1855. | | | |
|----------------------|-----------|--------------|--------------|
| Mints. | Gold. | Silver. | Total. |
| Culiacan..... | \$144,208 | \$737,500 | \$881,708 |
| Chihuahua..... | 17,200 | 475,500 | 492,700 |
| Durango..... | 73,647 | 809,171 | 882,818 |
| Mexico..... | 155,283 | 4,013,240 | 4,168,523 |
| Guanajuato..... | 555,300 | 4,606,800 | 5,162,100 |
| Guadalajara..... | 10,200 | 823,000 | 833,200 |
| San Luis Potosi..... | .... | 1,849,795 | 1,849,795 |
| Zacatecas..... | .... | 2,519,000 | 2,519,000 |
| Aggregate..... | \$946,222 | \$12,837,355 | \$13,783,577 |

| In 1856. | | | |
|----------------------|-----------|--------------|--------------|
| Mints. | Gold. | Silver. | Total. |
| Culiacan..... | \$272,000 | \$604,100 | \$876,100 |
| Chihuahua..... | 10,000 | 420,000 | 430,000 |
| Durango..... | 57,072 | 522,652 | 579,724 |
| Mexico..... | 184,207 | 4,401,793 | 4,586,000 |
| Guanajuato..... | 479,476 | 4,000,524 | 4,480,000 |
| Guadalajara..... | 5,200 | 545,400 | 550,600 |
| San Luis Potosi..... | .... | 2,070,000 | 2,070,000 |
| Zacatecas..... | .... | 2,070,000 | 2,070,000 |
| Aggregate..... | \$998,212 | \$12,208,001 | \$13,206,213 |

The ancient tribunal of commerce in 1805 estimated the amount of money in circulation in New Spain at something more than \$78,000,000, which, being compared with the population, gave an average of \$14 per head. Taking this estimate as a basis, and also taking into consideration the prosperity of mining operations ever since that date, with the general improvement in the circumstances of a class who were formerly in misery, it is not an overestimate to say that the amount in circulation in 1856-'7, notwithstanding the great annual exportation, exceeded \$100,000,000. Although this sum is undoubtedly sufficient for all the interior wants of Mexico, considering the small extent to which operations are carried on in agriculture, manufactures, and commerce, the fact that the greater portion of it is in few hands, with the want of confidence and absence of banks of issue, makes it comparatively useless. The legal exportation of specie from all parts of the republic, for the year 1856, was as follows:

| | | | |
|-----------------|-----------|---------------------|--------------|
| Acapulco..... | \$22,435 | Tabasco..... | \$52,841 |
| Campeche..... | 120,807 | Vera Cruz..... | 8,185,022 |
| Guaymas..... | 112,022 | Camargo..... | 7,000 |
| Matamoros..... | 795,945 | Mier..... | 6,322 |
| Mazatlan..... | 1,331,039 | Piedras Negras..... | 114 |
| Manzanillo..... | 531,469 | Paso del Norte..... | 7,642 |
| San Blas..... | 845,287 | Zapaluta..... | 7,540 |
| Saltillo..... | 10,320 | | |
| Tampico..... | 4,415,522 | Total..... | \$16,479,012 |

From the conquest of Mexico, in 1521, to the year of independence, 1821, a period of three centuries, the business of mining was in most respects brought to such perfection that during the space of 35 years in which it may be said this branch of labor has been open to the science of foreign nations, no very material improvement has been effected on the old system, except in the introduction of steam engines for clearing deep mines of water. The kings of Spain held the mines of Mexico as royal property, but any citizen of the country was allowed to work them by paying over to the royal treasury one fifth of the product thereof. The government of Mexico, after she obtained her independence, decreed the mines to be public property, but placed certain restrictions on the miners, and required a small percentage on their products to be paid into the national treasury. This tax is now relinquished, and any citizen or foreigner can, by the right of discovery, denounce or record a mine, and obtain the right to work a certain number of *varas* free of all tribute. It is believed that the laws of the *mineria* of Mexico are well calculated to develop the mines and favor the miners, and it is doubtful whether any material improvement can be made on the present code. Statistics relating to this subject previous to the revolution are, doubtless, more complete and trustworthy than such as we have since; yet those that come to us from the former period give a general idea only of the vast product of silver in Mexico, and while we have the same general means of judging of their unfailling richness since that epoch, the official data are much more imperfect owing to the revolutions which have almost constantly prevailed, the occasional destruction of government records, and more than all else, the general system of smuggling which has, during this unhappy state of affairs, been carried on over the frontiers, and through nearly all the ports in the country.—Mexico unites the vegetation of North and South America, but its flora resembles more nearly that of the latter. By reason of its peculiar geological structure, and its variations of climate and temperature according to elevation, it presents an immense variety of indigenous productions; and scarcely a plant exists on the globe which cannot be grown in some part of the country. Whole provinces on the table-land produce alpine plants, oaks, chestnuts, and pines, spontaneously. Rice, Indian corn, the banana, the sugar cane, tobacco, coffee, jalap, and cacao are cultivated. The caoutchouc tree, milk tree, and vanilla plant abound. The *rhus copallinum*, from which the copal of Mexico is produced, logwood, mahog-

any, and many other large timber trees grow in the forests. There are large fields of the American aloe, from which a fermented liquor called *pulque* is prepared. From this plant the ancient Mexicans made their cordage and their paper. The *opuntia cochinellifera*, which nourishes the cochineal insect, is indigenous to Mexico, and long before the conquest was cultivated for the valuable dye which the insect affords. There are other dye woods, medicinal plants, and trees that furnish precious gums in great variety.—The various quadrupeds which minister to the use of man for food or other purposes abound in such quantities that, owing either to the smallness of population, or to the little use made by the great mass of the people of meat for their daily food, there is perhaps no other country in the world where cattle are sold so cheap as in Mexico. Wild animals, valuable as articles of food, are found in equal abundance throughout the country. The number of horses and asses is enormous. The same may be said of mules, which are commonly employed for carriages, for agricultural labor, and for working in the mines. Wild horses, said to be of Arabian extraction, wander in vast herds over the interior provinces, and also horned cattle and sheep, all from imported stock; the gigantic wild stag, with branching horns, is famous for its beauty and swiftness. The tapir, the jaguar, and the wolf are common. Fish, in immense numbers and of great variety, are found both on the coasts of the gulf and in the Pacific, as well as in the lakes and streams of the interior. The tortoise-shell fishery on the coast of Yucatan, and the pearl fisheries on the coast of Lower California, yield abundantly, and are of great importance. Of birds fit for use there are above 70 different sorts in the republic. Of the birds which are distinguished by the beauty of their plumage and the sweetness of their song, there are, according to Clavigero, about 50 or 60 different species. Many birds are peculiar to Mexico, and others, as the eagle and hawk, are superior to the same species in Europe. The turkey is found wild; there are more than 20 different species of ducks, and geese and other fowls abound. Bees are successfully raised for their wax rather than their honey. The silkworm was introduced by the Spaniards soon after the conquest, and large plantations of mulberry trees were set out, but most of them were destroyed by the Indians in the 18th century to avoid the exactions to which the silk trade exposed them.—The native population of Mexico is composed of 6 races: 1, whites, descended from the Spanish settlers; 2, Indians; 3, negroes; 4, mestizoes, the offspring of whites and Indians; 5, mulattoes; 6, zamboes or chinos, the offspring of negroes and Indians. The foreigners in the country are principally Spaniards, Germans, French, English, and Americans from the United States. The negroes are computed at only 6,000. At the present day all the races are on a footing of perfect legal and political equality.

The Indians of Mexico do not differ materially in appearance from those of other parts of America. They have the copper color, straight black hair, small beard, high cheek bones, and other prominent characteristics of the red race. They are habitually grave, melancholy, and taciturn. In the imitative and mechanical arts they show great skill, and they possess a remarkable fondness for flowers, in arranging which for ornament they display much elegance of taste. Their social condition is for the most part one of extreme poverty. The men are well made and muscular, and are simple and temperate in their habits, living almost exclusively upon vegetables. They are chiefly occupied in agricultural pursuits. The white Mexican is commonly described as proud, indolent, abstemious, much addicted to gambling, and much under the influence of the priests. Of the mixed races, the mestizoes are mild and amiable, while the mulattoes are distinguished by the violence of their passions, their superior energy and activity, and their volubility. In the northern states there are powerful tribes of savage Indians, who live by rapine, and are constantly at war with the civilized Mexicans.—The number of landed estates of the republic is 13,000, the value of which is estimated at \$720,000,000, and town property at \$635,000,000. This gives a total valuation of real estate at \$1,355,000,000, or an average of \$163.50 per head. The agricultural productions of Mexico are still limited to the absolute necessities for the consumption of its inhabitants, and the extent of ground under tillage is not equal to more than one eighth of the whole arable land of the republic. The principal productions are maize, beans, and chile (which three articles, in general, constitute the only food used by the poorer class), wheat, barley, rice, potatoes, peas, lentils, American aloe, nopal, sugar cane, cacao, coffee, cotton, tobacco, pepper, anise, vanilla, sarsaparilla, and all kinds of fruits and horticultural productions; to which may be added indigo, cochineal, wax, and silk, of which two last articles large quantities are already produced in the states of Michoacan, Jalisco, and Guanajuato. As regards the annual value of the agricultural produce of Mexico, the statistics are so limited and unsatisfactory that it is impossible to arrive at any thing like a correct estimate. The best information which we possess is contained in an account presented in the year 1817, by Don José Maria Quiroz, at that time secretary to the chamber of commerce in Vera Cruz, according to whom the total value of agricultural produce in New Spain amounted then to \$138,850,121 annually, including \$4,997,496 as the amount of produce exported; which sum, when compared with the then existing population of 5,810,005, gives an average of \$24 per head. This estimate, however, cannot serve as a basis to arrive at its present value, considering the progress, even though slow, which has been made since in this and in all the other branches of industry. For want of better data, we may take the

amount of population, and calculating the quantity of agricultural produce necessary for the support of each person at \$25 per annum, or about 7 cents per day, the result is a yearly produce equal in value to \$197,000,000; and if to this be added the amount consumed by cattle, the production of cotton (70,000 quintals annually), cochineal (625,000 lbs.), silk, wax, and many other articles, and \$40,000,000 as the value of the increase of domestic animals, and of their natural produce, such as milk, eggs, tallow, &c., the annual value of agricultural productions throughout the whole country may be safely estimated at \$260,000,000. The cultivation of sugar cane, as much from its enormous yield as from its good quality, is of the greatest importance. In Mexico, Puebla, Vera Cruz, Michoacan, Tabasco, Oajaca, Chiapa, Yucatan, Sonora, and Lower California, there are large plantations. In the 6 first mentioned states 40,000,000 lbs. of sugar are manufactured yearly. Coffee has been produced of very good quality in the districts of Huilen and Tessic, in the state of Jalisco; but the best is found in Cuernavaca, Colima, and some parts of the state of Vera Cruz; it is equal in quality to the best produced in any part of the world. Tobacco is cultivated with success in many parts of the republic, and is destined to become an article of extensive exportation, particularly that produced in Tabasco, called *tabaco de corral*. Indigo is found wild in great quantities in many parts of Oajaca, Tabasco, Yucatan, Chiapa, Michoacan, and Colima. That produced in the last mentioned place is considered to be of a superior quality. Rice is cultivated to a considerable extent in the tierras calientes, in damp and marshy situations, and yields from 40 to 60 per cent. It is destined to become one of the principal objects of agricultural industry, as the soil and climate of many localities are peculiarly adapted to its growth. Cacao of excellent quality is found in Tabasco and Soco-nusco, in the state of Chiapa, and other places in the states on that side of the gulf, and, perhaps, yields the best in the world. Flax and hemp are successfully cultivated; the latter particularly in the southern districts of Michoacan, where it grows even spontaneously. The product is very large, and the fabrics made from it are highly approved. Throughout the cotton-growing districts of the United States the cotton plant is of annual growth; frost destroys it, and the planter is obliged to renew the seed for every crop. But in the tierras calientes of Mexico the tree propagates itself, and the laborers are only required to keep the fields free of useless vegetation. The production, however, is very limited, not at all meeting the wants of the factories in the republic, and probably does not exceed in the aggregate over 25,000 bales of 400 lbs. each per annum. A sample of beautiful cotton, called "silk cotton," said to have been raised by Col. David Randon, Fort Bent co., Texas, from seed obtained in Mexico, was received in New Orleans in 1858. It resem-

bles that grown in Texas from seed brought from Nicaragua, near Leon, and which for fineness and silkiness, as well as tenacity of fibre and tenuity of thread, has never been surpassed. About 250 lbs. of this cotton can be picked by one hand in a day, whereas of the sea island not more than 80 lbs. can be picked. The seed is planted about Sept. 1, and always yields a sure crop, which can be raised at one half the expense attendant upon its culture in the Mississippi valley. The cultivation of the cochineal has always been of the greatest importance in the state of Oajaca. The amount and value of the crop in that state alone, in the years 1854 and 1855, were as follows:

| Years. | Cochineal mescalillo, lbs. | Grana blanca, lbs. | Granilla, lbs. | Value. |
|------------|----------------------------------|--------------------------|-------------------|-----------|
| 1854..... | 150,525 | 632,625 | 2,450 | \$528,438 |
| 1855..... | 145,050 | 500,525 | 1,550 | 459,709 |
| Total..... | 295,575 | 1,133,150 | 4,000 | \$988,143 |

The vanilla bean is cultivated on a few plantations in Oajaca, and also grows there, as in many other parts of the coast, spontaneously, in large quantities. In the state of Vera Cruz it has become one of the principal articles of exportation, with a gradual increase of shipments annually. Although the cultivation of the vine might be a most important branch of industry, it is at present almost confined to the town of Parras in the state of Coahuila, where excellent wine has been produced. In Chihuahua and Sonora, however, wine and brandy are produced from the grape; and in Durango, Zacatecas, and Jalisco, a liquor called *mescal* is manufactured to a large extent. Maize is cultivated as well in the hot regions as in the temperate and cold. It is very largely consumed in the country, both for human food and for fattening animals. In the hot regions it produces from 250 to 300 grains for each one planted, and in a district near the capital as many as 600. In many parts of the country two crops are gathered annually; and in fact

there are frequent instances on the gulf coast of three harvests on the same ground in one year. In the fields of wheat and maize is sown the *frijol*, or black bean, which is most extensively consumed in Mexico, and is as much a national dish with the Mexicans as the potato is with the Irish. Wheat is cultivated on all the central table-lands. The best is found in Atlisco, in the state of Puebla, and in the fertile valleys between Queretaro and Guanajuato, called Bajio, where it yields 60 to 1. In some parts of the state of Sonora, and other sections of the republic, the yield has been computed by good authorities at nearly double that amount. Barley is also extensively cultivated on all the central table-lands, with equally abundant harvests. There is a very great consumption of it throughout the country, as it is one of the principal articles of forage used by the muleteers and wagoners for the animals of the immense transportation trains. Beside almost every variety of fruit trees to be found in other parts of the world, Mexico possesses an inexhaustible source of wealth in the natural products of her forests, which furnish abundantly a supply of the several woods employed in ship building and other mechanical arts, either for works of use or fancy. Every branch of agricultural industry is susceptible of augmentation and improvement, and if a proper spirit of enterprise could be awakened in its inhabitants, Mexico might become one of the most prosperous countries on the American continent.—The manufacture of sugar is extensively carried on by private individuals, who commonly have mills of a very primitive and imperfect character on the plantations where the sugar is grown. In some places, however, the modern improvements in machinery have been introduced. Aguardiente is also distilled on private farms. Wines and brandies are made in considerable quantities in the states of Coahuila and Chihuahua, and might be produced in many other parts of the republic. The manufacture of cotton cloths and threads is shown in the following table:

| States. | Number of factories. | Number of power looms. | Number of hand looms. | Number of spindles in operation. | Yearly consumption of cotton, quintals. | Factory prices per piece, \$7 yds. by 7-8. | Cost of cotton at factory per quintal. |
|-----------------|-------------------------|---------------------------|--------------------------|--|--|--|---|
| Coahuila..... | 1 | 40 | .. | 1,800 | 1,800 | ..... | \$21 |
| Durango..... | 5 | 117 | .. | 4,586 | 4,781 | ..... | 18 to 24 |
| Guanajuato..... | 1 | .. | .. | 900 | 950 | 4 50 to 6 00 | 20 " 25 |
| Jalisco..... | 5 | 497 | .. | 18,353 | 24,350 | 4 50 " 5 50 | 20 " 24 |
| Mexico..... | 8 | 850 | 584 | 22,350 | 21,400 | 3 63 " 4 00 | 22 " 23 |
| Puebla..... | 17 | 493 | 263 | 40,548 | 36,351 | 3 00 " 4 57 | 20 " 26 |
| Queretaro..... | 1 | 500 | .. | 7,500 | 15,000 | 5 00 | 26 |
| Sonora..... | 1 | 60 | .. | 1,224 | 2,500 | 5 00 | 26 |
| Vera Cruz..... | 6 | 509 | 48 | 22,444 | 18,361 | 3 00 " 4 50 | 15 " 25 |
| Colima..... | 2 | .. | .. | .... | .... | .... | .... |
| Total..... | 47 | 3,001 | 894 | 121,354 | 124,686 | .... | .... |

The total cost of buildings and machinery was \$7,872,951; the number of hands employed, 10,000; and the annual expenses, \$1,261,000. Although some of the finest cloths are manufactured in these, the principal product consists of thread and brown cottons, or *mantas*. Ac-

cording to the statistics published by the *ministerio de fomento* in 1854, there were 7,274,779 lbs. of the former and 872,224 pieces of the latter made at these factories in the preceding year. A large quantity also of tapes, gloves, stockings, and other similar articles, are manu-

factured in Mexico. In addition to the numerous hand looms in various parts, by which common cloth, frieze, serges, druggets, blankets, &c., are manufactured, there are now (1860) 8 large woollen manufactories in the federal district, and in the states of Mexico, Queretaro, Zacatecas, and Durango, at which fine cloths, cassimeres, carpetings, baize, flannels, and other stuffs are produced, equal to any imported. In the capital, and in Puebla and Guadalajara, there are above 70 hand machines for spinning and twisting silk. The whole quantity twisted in Mexico in a year may be estimated at 40,000 lbs. There are 8 paper manufactories in the district of Mexico and the states of Puebla and Jalisco, which produce not only sufficient to supply the presses of the republic, but considerable quantities for other uses. Cotton and the fibres of the maguey are the principal materials used. In the states of Durango, Mexico, Michoacan, and Oajaca, there are various iron founderies, where the best quality of iron is manufactured. Mexican bar and tire iron is preferred to the English for quality. There are no certain data by which to ascertain the present annual value of the manufactures of all kinds; but with due allowance for the great progress which has been made in this branch of national wealth, we may safely put down the sum total at \$90,000,000 or \$100,000,000.—The total annual value of the foreign imports into the republic of Mexico was estimated by Sr. Lerdo de Tejada in 1856 at \$26,000,000, and of exports at \$28,000,000. The general prevalence of contraband trade, particularly along the Pacific coast, renders it difficult however to ascertain the total importation of merchandise or exportation of specie; and the entire commerce, legal and illegal, may be considered nearly if not quite double the above amount. The difference in favor of the exports, as given above, is attributed to the large sums annually exported by the government in payment of interest on the foreign debt, and to the large amounts exported by foreigners who, after some residence in Mexico, return to their homes. The imports consist chiefly of cotton, linen, woollen, and silk fabrics, as well as cotton and silk in their raw state, brandies, wines, liquors, oil, earthenware, glass, quicksilver, iron, guns, steel, tin, hardware, watches, jewelry, paper, machinery, wax, cocoa, carriages, furniture, musical instruments, books, and other articles of minor importance. Of the \$28,000,000 of exports, about \$22,000,000 or \$23,000,000 are of gold and silver, in coin and bars. The remainder is made up of cochineal, vanilla, tobacco, coffee, jalap, sarsaparilla, American aloe, flax, copper, hides, tallow, timber, cattle, logwood, indigo, cocoa, pepper, salt, tortoise shell, pearls, mother-of-pearl, meat and fish salted, rice, beans, hats, woollen fabrics, biscuit, fruit, sugar, preserves, and other articles of small value. In 1856 the duties on cotton, linen, silk, and woollen manufactures of all kinds were reduced 15 to 40 per cent.; on iron, ironmongery, and hardware, 33½ to 40; cutlery, 37½ to 40; jew-

elry, 40; wine, 80; glass, 40; and miscellaneous articles, as paper, cinnamon, butter, pictures, &c., 10 to 60 per cent. The amount of imports from different countries, as estimated by Sr. Lerdo de Tejada, is as follows:

| | |
|--|--------------|
| Great Britain..... | \$12,500,000 |
| United States..... | 4,500,000 |
| France..... | 4,500,000 |
| Germany..... | 1,880,000 |
| Spain..... | 700,000 |
| Belgium..... | 300,000 |
| Sardinia..... | 90,000 |
| Guatemala, Ecuador, New Granada, Venezuela, and Chili..... | 250,000 |
| Island of Cuba..... | 600,000 |
| India and China..... | 700,000 |
| Total..... | \$26,000,000 |

The exports of Mexico are mainly shipped, in the shape of silver coin and bullion, direct to England, by the British steamers which touch at Vera Cruz and Tampico, and by British men-of-war from the Pacific coast. The rest goes chiefly to the United States. The total commerce, imports and exports, is distributed nearly as follows:

| | |
|--|--------------|
| Exchanges with England..... | \$33,400,000 |
| “ “ United States (1855)..... | 8,700,000 |
| “ “ France..... | 5,500,000 |
| “ “ Germany..... | 2,000,000 |
| “ “ Spain..... | 1,200,000 |
| “ “ Belgium..... | 400,000 |
| “ “ Sardinia..... | 100,000 |
| “ “ Guatemala, Ecuador, New Granada, Venezuela, and Chili..... | 500,000 |
| “ “ Island of Cuba..... | 1,200,000 |
| “ “ India and China..... | 1,000,000 |
| Total..... | \$54,000,000 |

The importations from Great Britain into Mexico may be illustrated from a report made by order of parliament. For a period of 7 years from 1840 to 1846, both included, the sum total of the value of the imports was nearly \$82,246,705, making an average value of \$12,000,000 per annum. The principal articles of import were drugs, haberdashery, and wearing apparel, arms and ammunition, malt liquors, printed books, manufactures of brass and copper, furniture, carriages, coals, cordage, manufactures of cotton, earthenware of all kinds, glassware, hardware and cutlery, hats, iron and steel in bars, manufactured lead, prepared skins, harness and saddles, manufactures of flax, machinery and machines, and musical instruments. Of these articles, cotton fabrics rank highest, the estimated value of the importations for the 7 years amounting to more than \$57,000,000, while those of linen (which come next in order of value) were more than \$12,000,000, leaving only some \$12,000,000 or \$13,000,000 as the aggregate value of all the other imports from Great Britain into Mexico. Matamoras, Tampico, Tabasco, Minatitlan, Tehuantepec, and La Paz are engaged in trade with the United States; but the principal port is Vera Cruz, which was the place of destination of upward of ¾ of the American imports of 1859. The following statement, made up from U. S. treasury reports, shows the total exports from Mexico to the United States and imports from the United States into Mexico from 1826 to 1859:

| | Imports. | | Imports. |
|-------------------------|---------------|-------------------------|---------------|
| 1836 | \$3,301,000 | 1848 | \$1,471,807 |
| 1837 | 4,173,000 | 1849 | 1,794,000 |
| 1838 | 2,834,000 | 1850 | 1,152,331 |
| 1839 | 2,301,151 | 1851 | 1,281,130 |
| 1840 | 4,397,480 | 1852 | 692,400 |
| 1841 | 6,173,000 | 1853 | 4,855,446 |
| 1842 | 2,467,541 | 1854 | 2,990,900 |
| 1843 | 3,408,081 | 1855 | 2,812,807 |
| 1844 | 2,900,000 | 1856 | 1,261,730 |
| 1845 | 9,000,271 | 1857 | 2,364,930 |
| 1846 | 6,000,000 | 1858 | 2,555,304 |
| 1847 | 2,550,200 | 1859 | 2,185,400 |
| 1848 | 2,767,200 | 1860 | 2,922,604 |
| 1849 | 2,164,807 | 1861 | 2,702,200 |
| 1850 | 2,515,341 | 1862 | 2,615,300 |
| 1851 | 2,634,307 | 1863 | 2,215,000 |
| 1852 | 1,304,004 | 1864 | 2,302,546 |
| Total | \$184,700,000 | Total | \$172,700,070 |
| Average per annum | 2,390,000 | Average per annum | 2,315,000 |

The following is a statement of the trade of the United States with Mexico for the year ending June 30, 1859:

| Vessels. | Exports to Mexico. | Imports from Mexico. | Total. |
|----------------|--------------------|----------------------|--------------|
| American | \$3,034,204 | \$5,119,443 | \$8,153,730 |
| Foreign | 904,500 | 2,790,500 | 3,695,000 |
| Total | \$3,938,704 | \$7,909,943 | \$11,848,647 |

Of the exports, \$2,307,170 was of domestic and \$685,376 of foreign produce. Of the imports, \$4,830,002 was free of duty. The importation of precious metals was as follows: gold coin, \$31,742; silver coin, \$3,924,062; gold bullion, \$5,632; silver bullion, \$184,424; total, \$4,095,890. The importation of gold and silver in 1858 amounted to \$4,868,964, and in 1857 to \$4,958,964. The commerce of the United States with the principal Mexican ports employed in the year ending Sept. 30, 1858, 116 vessels. Although it is impossible, in the absence of complete data, to give a correct statement of the interior commerce of the republic, or of the value of its domestic exchanges, it is, nevertheless, easy by calculation to arrive at an approximate result, taking as a basis the produce of its agriculture and industry, of the mines and cattle, as well as the conveyances of real estate, and finally the amount of foreign merchandise, computed according to its value in the native markets; all of which cannot be estimated at less than \$450,000,000 per annum; and, admitting that one half of the national products are not articles of mercantile speculation, on account of their passing from production to immediate consumption, and that the other half only pass through two hands ere disappearing from circulation, it appears that the interior commerce of the republic amounts, at the present date, annually, to more than \$400,000,000. As a proof that there is no exaggeration in the above estimate, it will suffice to say that, according to the mercantile statistics published by the chamber of commerce in Mexico, Puebla, Queretaro, Guanajuato, San Luis Potosi, and Guadalajara, from the years 1842 to 1846, inclusive, the value of domestic and foreign goods, including specie, legally introduced into these 5 departments alone, based upon the custom house valuation, which is generally less than the real value, amounted annu-

ally to more than \$140,000,000. The medium of exchanges by drafts, although not generally understood or adopted throughout the republic, being in operation only between the capital and such points as are open to foreign commerce and the principal cities, amounts, according to trustworthy data, to \$30,000,000 or \$40,000,000 per annum. The banking and discount business is also of some importance, in the city of Mexico alone amounting annually to between \$8,000,000 and \$10,000,000, and in the other parts of the republic to an equal sum.—The conveyance of all kinds of merchandise throughout the republic of Mexico is effected by pack mules, and wagons drawn by mules and oxen. With this system and the bad state of the roads generally, it will be easily understood that transportation is not only slow but costly, and one of the chief obstacles to the development of the great resources of the country. The average distance performed by mules and wagons is from 15 to 18 miles per day; but a company recently established runs a line of wagons between Vera Cruz and Queretaro, passing through the city of Mexico, which average during the dry season from 36 to 45 miles per day, thus performing the journey (390 miles) in 11 days. The cost of transporting merchandise varies much, according to the price of wages and fodder, always rising, however, during the rainy season. As a general thing, freights on the most frequented roads do not exceed two cents per arroba of 25 lbs. per Mexican league. Personal travelling is generally performed on horses or mules, which is not only the most economical, but in many cases the easiest way, owing to the narrow and precipitous roads. In some parts of the tropics, as for instance between Jalapa and Vera Cruz, litters supported by mules or men are used. For the general conveyance of passengers, beside private carriages, there is a line of diligences performing round trips from Mexico to Vera Cruz, to San Blas on the Pacific, and to various points of the interior, in the following order: to Puebla every day; to Orizaba and Vera Cruz, Pachuca and Toluca, 6 times a week; to San Blas, Morelia, Cuernavaca, Cuantla, Tulancingo, 3 times a week; and from Guanajuato to Leon, 3 times a week. Beside the above principal lines of diligences, there are others performing service between the following places 3 times a week: Puebla and Vera Cruz, by Perote and Jalapa; Mexico, Ameca, and Ixmiquilpan; Guadalajara and Zaptlan; Lagos, Zatecas, and Aguas Calientes; Puebla, Matamoros, and Izucar; and Sisal and Merida. The fare by the diligences as a general rule varies from 20 to 40 cents per Mexican league. The diligences average from 9 to 12 miles an hour, according to the state of the roads. Arrangements are in contemplation for a good carriage road from the city of Mexico to Acapulco, which will enable passengers landing at Vera Cruz to reach Acapulco on the Pacific coast with ease and despatch.—The national debt of Mexico is divided into interior and

exterior. The first arises out of sundry obligations contracted under the viceroyalty and after the independence; and the second out of loans contracted in London in the years 1823 and 1824. The capital of the foreign debt, or amount due under this head, according to the last convention, is £10,241,650, which, at \$5 per pound sterling, is equal to \$51,208,250; for 6 dividends due up to Dec. 31, 1855, \$4,608,741; total, \$55,816,991. The total amount of the interior debt, Dec. 31, 1850, after making the deduction prescribed by the law of Nov. 30 of the same year, was calculated at \$40,000,000, of which the *junta de credito publico* had recognized and liquidated the sum of \$16,829,775 up to Jan. 1, 1855; but as certain amounts paid previously, and the value of credits formed by after conventions, which figure separately, were taken after the above calculation, this debt did not amount at the beginning of 1857 to more than \$30,000,000, which has since been increased to \$61,950,033, making the total national debt \$117,767,024. Notwithstanding that a law was made, Nov. 24, 1856, designating the revenues of the supreme government and those of the states, it has not been put in practice, nor are the anterior laws on the subject enforced; the consequence of which is that many of the states, not having a systematized revenue, take such sums from the general fund at their disposal as they may require for their own wants. Sr. Lerdo de Tejada, in his *Cuadro sinoptico* (1856), says: "Notwithstanding that, under our present form of provisional government, we cannot well define the obligations which weigh upon the general and state governments, the latter have already assumed the responsibility of these internal expenses and administration, and the former has done likewise as relating to the whole nation, following the order observed under the federal system of 1852." The total annual expenditure of the general government, according to the statistics published by the minister of finance, Dec. 31, 1855, was \$14,228,325, as follows: government offices, public establishments, and improvements, \$5,294,181; army and navy, \$4,309,377; revenue officers and government necessities, \$765,327; public debt, interest, and sinking fund, \$3,584,690; municipality of Mexico, \$274,750.—There are no complete statistics in existence of the present state of education in Mexico. From partial returns it appears that in 1856 there were in the city of Mexico 123 primary schools, with 11,549 pupils; in the state of Vera Cruz (1854), 170 schools, 8,249 pupils; in Oaxaca (1852), 726 schools, 30,066 pupils; in Zacatecas and Aguascalientes (1850), 17,903 pupils; in Guanajuato (1850), 7,992 pupils; in Queretaro (1854), 4,402 pupils; in Puebla (1855), 17,664 pupils; in Tamaulipas (1854), 8,469 pupils; in Yucatan (1851), 4,234 pupils; in Tabasco (1856), 605 pupils; in Durango (1850), 8,081 pupils; in Sonora (1851), 756 pupils; in San Luis Potosi (1849), 3,900 pupils; and in the territory of Tlascala (1849), 3,170 pupils. From a comparison of these

numbers with the total population of the states mentioned, it appears that the proportion of pupils in the population is one in 37. The clergy maintain and control 10 seminaries, viz., one in each of the following cities: Mexico, Puebla, Morelia, Guadalajara, Monterey, Oaxaca, Merida, Durango, Chiapa, and Oculiacan. These institutions contain collectively about 3,000 students. In the city of Mexico there is a university founded in 1551, which had at one period 200 students, but is now nearly deserted. There are beside 10 colleges or seminaries under the control of the government, viz.: the college of San Juan de Letran, with 171 students; of San Gregorio, with 140 students; of San Ildefonso, with 240 students; the school of medicine, with 206 students; the college of mines, with 228 students; the academy of fine arts, with 274 resident students and 7 maintained in Europe; the military college, with 97 students; the school of agriculture, with 45 students; and the school of commerce, with 87 students. The following states possess each a college maintained by the government: Mexico, Puebla, Oaxaca, Michoacan, Guanajuato, Durango, Zacatecas, Aguascalientes, San Luis Potosi, Chiapa, and Chihuahua. In the state of Vera Cruz there are four and in Queretaro two state colleges; and in Yucatan there are, beside the state college, a university at Merida and a naval school at Campeche. There are two public libraries in the city of Mexico: that of the cathedral, founded in 1788, which has 12,000 printed vols. and a great number of MSS.; and that of the university, founded in 1762, which has about 9,000 vols. In Puebla there is a college library of 80,000 vols.; and in Mexico, the library of the college of San Juan de Letran has 12,161 vols., and that of San Ildefonso 8,861 vols. The number of periodicals of all kinds in the republic was 44 in 1856, of which 11 were published in the city of Mexico.—The statement of the minister of justice and ecclesiastical affairs, presented in 1852, returns the number of the clergy as 4,615, of whom 1,043 were regulars. The number of nunneries was 58, containing a total of 1,484 nuns; beside which, there were 5 establishments belonging to the sisters of charity, with 87 sisters and 41 novices. The ecclesiastical hierarchy consists of one archbishop, at Mexico, and 12 bishops, at Puebla, Michoacan, Jalisco, Nuevo Leon, Oajaca, Durango, Yucatan, Chiapa, Sonora, Lower California, San Luis Potosi, and Vera Cruz. The revenues of the clergy may be divided into four great classes, viz.: 1, those of bishops and cathedral chapters; 2, those of private ecclesiastics and chaplains; 3, those of curates and vicars; and 4, those appertaining to various religious communities of both sexes. The first are principally composed of taxes known as tithes, or *diezmos y primicias*, the proceeds of which were formerly very great, consisting of one tenth of all produce gathered in the republic, and the first born of all domestic animals raised for profit. Latterly, however, this revenue has much de-

creased; as, by a law passed on Oct. 27, 1888, all farmers and laborers were released from obligation to pay it. Notwithstanding the law, there are many persons who, from conscientious motives, still continue to pay tithes. The clergy also receive the interest of large bequests left by devout persons for masses to be said for their souls. The bishoprics of Sonora, Lower California, New Leon, Chiapa, and Yucatan enjoy government pensions, amounting together to the sum of \$32,200. The college of "Our Lady of Guadalupe" has 25 lotteries, which are drawn annually, with a fund of \$18,000 each, some estates, and a capital of \$621,000 recognized by the government. The private ecclesiastics support themselves by revenues derived from chaplaincies, which are sums subscribed by religious persons for that purpose, amounting generally to about \$8,000, lent out at interest, and by the various sums received in charity and for saying masses. The revenue of curates is derived from parochial dues for baptisms, marriages, deaths, &c.; from masses said for particular persons; and lastly from the profits arising out of the sale of rosaries, medals, wax, &c. The revenue of convents is obtained by charity, masses, and burials in their own churches, beside the income from their valuable estates. The nunneries are supported by the produce of their estates, with the exception of one or two which do not possess any property, and are entirely supported by charity. There are several cathedrals and parishes deriving a revenue from estates and investments, which is appropriated to the wants and service of the clergy in general. It is difficult to arrive at the exact value and revenue of the property of the clergy, but an approximate estimate may be made, by taking as a basis the annual value of agricultural produce, the number of births, marriages, and deaths, &c. According to these tables, it can be safely computed that the total amount collected at this date by the clergy of Mexico, under the head of tithes, parochial dues, charities, masses, and sale of devotional articles, is from \$6,000,000 to \$8,000,000 annually. So far as regards the property of the clergy, some writers have estimated it as one half of the whole real estate in the country; others at one third. Setting these statements aside, the total value of their property—including sums subscribed for chaplaincies and gifts, estates, houses, churches, and other resources—may be computed at \$250,000,000 or \$300,000,000, notwithstanding the great losses which they are said to have suffered for some years past. In the city of Mexico alone, which contains 5,000 houses valued at \$80,000,000, the clergy own at least one half. The incomes of the above, added to the tithes and parochial dues, &c., warrant us in stating that the Mexican clergy collect throughout the republic annually a sum of \$20,000,000.—The earliest inhabitants of Mexico of whom we have any knowledge were the Toltecs, who, coming from the north, entered Anahuac in the 7th century

of the Christian era. They are said to have been skilful in agriculture and the mechanic arts; were nice workers of metals; and, in short, the true founders of the civilization of this part of the American continent. Their capital was Tula, N. of the Mexican valley. In the 11th century the Toltecs, reduced in numbers by famine, pestilence, and war, quitted Mexico and spread themselves over Central America, where they constructed great cities whose ruins still exist. To the Toltecs succeeded the Chichimecs, a rude tribe also from the north-west, who entered Anahuac about 1170. They were followed not long afterward by the Aztecs or Mexicans and Acolhuans or Tezcucans. The latter, a people of mild manners, readily imbibed some degree of civilization from the few Toltecs who had not followed the general emigration of their nation, and their capital, Tezcuco, on the eastern border of the lake of the same name, soon became a populous and comparatively a refined city. The Aztecs or Mexicans arrived in the valley about 1200, but they led a migratory and precarious life till 1325, when they founded the city of Mexico. About 100 years later the Tezcucans were subdued by a kindred nation, the Tepanecs. The Tezcucan prince Nezahualcoyotl organized an insurrection against the conquerors, and, with the aid of the Mexicans, succeeded not only in throwing off the yoke, but in subjecting the Tepanecs themselves, whose territory was given to the Mexicans in reward for their services. A league was then formed between Mexico, Tezcuco, and the neighboring little kingdom of Tlacopan, by which they agreed to support each other in war and to divide the spoils between them, one fifth to Tlacopan, and the remainder equally between the other states, according to most authorities. For a century of uninterrupted warfare this agreement remained in force, and was observed with fidelity. The allies soon conquered the whole of the valley, and in the middle of the 15th century, under Montezuma I., they carried their arms down the sides of the table-land to the borders of the gulf of Mexico. A succession of able princes still further extended their empire, and at the beginning of the 16th century, a few years after the discovery of America by Columbus, the Aztec dominion reached across the continent from the Atlantic to the Pacific, and the warlike emperor Ahuitzoll had successfully invaded and overrun Guatemala and Nicaragua.—The government was an elective monarchy, in which the sovereign was nearly absolute. Four of the principal nobles were the electors, who selected the new monarch from the brothers or nephews of his predecessor, thus keeping the line of succession always in the same family. The emperor was aided in the administration of affairs by councils composed of the principal nobles. The nobility seems to have consisted of the descendants of the earlier Aztec chieftains, who held large domains on condition of a sort of feudal service

to the monarch. In each of the principal cities was a supreme judge, who had exclusive and final jurisdiction in both civil and criminal cases, and from whose sentence there was no appeal. Below this chief justice there was in each province a court of 3 judges appointed for life by the emperor, and beside these throughout the country a body of inferior magistrates elected by the people in their several districts. The people also elected other subordinate officers, to each of whom was assigned the superintendence of a certain number of families. The laws of the Mexicans were registered and spread before the people in hieroglyphical paintings. They related chiefly to the security of persons rather than of property. Great crimes were all made capital; the murder even of a slave was punished with death. Adulterers were stoned to death, and thieves punished either by slavery or death according to the magnitude of the property stolen. Prodigals and drunkards were punished with death; and it was a capital offence to remove the boundaries of another's land; to alter the established measures; and for a guardian not to be able to give a good account of his ward's property. Marriage was celebrated with formality, and a special tribunal determined all questions relating to it, and had the exclusive right of granting divorces. Slavery existed in a mild form, and was confined to prisoners of war, debtors, and poor persons who sold themselves for a living. The children of slaves were free, and no one could be born to slavery in Mexico. The code of the Aztecs, says Prescott, "evinces a profound respect for the great principles of morality, and as clear a perception of these principles as is to be found in the most cultivated nations." The revenues of the government were derived from crown lands, which appear to have been extensive; from a tax on agricultural products paid in kind; and from a tribute of manufactured articles furnished regularly by the cities and provinces. Spacious granaries and warehouses were established in the capital for the reception of these articles, and a receiver-general watched over the returns of the tax collectors. These taxes in the beginning of the 18th century had grown to be very oppressive, and their weight and the vigor with which they were exacted created a general dissatisfaction which contributed to the easy overthrow of the empire. Communication was maintained between the capital and the remotest parts of the country by means of couriers, for whose accommodation post houses at intervals of 6 miles were established on the great roads. These couriers bore despatches, in the form of hieroglyphical paintings, at the rate of 200 miles a day. The Mexicans, like the Spartans, made war the chief object of national concern. Their tutelary deity was the god of war, and to capture victims for his altars was the chief end of military expeditions. Their armies were divided into bodies of 8,000 men, and these were subdivided into companies of 300 or 400, each with its own captain. Their

discipline was such as to draw forth the praise of their Spanish conquerors. In battle they sought rather to capture than to kill their enemies, and they did not scalp their foes like the Indians of the north.—Of the religion of the Mexicans our information is very imperfect. They recognized the existence of a supreme creator and lord of the universe, whom they addressed as "the God by whom we live, omnipresent, that knoweth all thoughts and giveth all gifts, without whom man is as nothing; invisible, incorporeal, one God, of perfect perfection and purity, under whose wings we find repose and a sure defence." They, however, worshipped also a plurality of deities, who presided over the elements, the changes of the seasons, and the various occupations of man. Of these there were 13 principal deities, and 200 inferior. The chief of all these gods, the patron deity of the nation, was Huitzilopochtli, the god of war. His pyramidal temples were the largest and finest of the public edifices, and his altars erected on their summits reeked with the blood of human sacrifices in every city of the empire. Quetzalcoatl, the god of the air and of agriculture and the useful arts, was a beneficent deity, whose principal temple was the great pyramid at Cholula. The Mexicans imagined three separate states of existence in the future life. The wicked were to expiate their sins in everlasting darkness. The good, especially heroes who fell in battle or in sacrifice, passed at once into the presence of the sun, and after some years their spirits went to animate the clouds and beautiful singing birds in the gardens of paradise. A third class, who died of certain diseases, were to enjoy a negative existence of indolent contentment. In naming their children they used a ceremony strongly resembling the Christian rite of baptism, the lips and bosom of the infant being sprinkled with water, and the Lord implored to wash away the sin that was given to it before the foundation of the world, so that the child might be born anew. Among their moral precepts was one that said: "Keep peace with all; bear injuries with humility; God, who sees, will avenge you." Another declared that "he who looks too curiously on a woman commits adultery with his eyes." The priests were very numerous, as many as 5,000 being attached to the principal temple of the capital. Different orders were devoted to the service of different deities; and at the head of the whole ecclesiastical establishment were two high priests, elected by the sovereign and his council, and who ranked next to the emperor in dignity and power. The priests married, but while in attendance on the idols lived at the temples in a sort of conventual discipline. The priesthood was maintained by the produce of estates belonging to the temples, the surplus of which was given to the poor. The temples, called *teocallis*, "houses of God," were very numerous, there being hundreds in each of the principal cities. They were solid pyramidal

masses of earth cased with brick or stone, many of them more than 100 feet square and of a still greater height. The ascent was by flights of steps on the outside, and on the broad flat summit were sanctuaries containing the images of the deities and altars on which fires were kept always burning. Human sacrifices to their deities had been adopted as a part of their worship by the Mexicans early in the 14th century, and gradually became frightfully frequent, the annual number being stated by some authors at 50,000, and by nearly all at 20,000. The heart of the victim was torn out by the priests and cast at the feet of the idol, and his body afterward devoured at a solemn feast.—For purposes of record and communication the Mexicans used a species of picture writing which has been compared to the Egyptian hieroglyphics. (See MEXICAN PICTURE WRITING.) The traditions of the Mexicans were embodied in songs and hymns which were taught to the children in public schools. The only remains of their prose compositions which have reached us are prayers and discourses which show that they paid much attention to eloquence and rhetorical effect. They had also theatrical exhibitions of a pantomimic sort, in which the faces of the performers were covered with masks, and the figures of birds and animals were frequently represented. They had a simple system of arithmetical notation, in which the first 20 numbers were expressed by a corresponding number of dots. The number 20 was expressed by a flag, and larger sums were reckoned by twenties and expressed in writing by repeating the number of flags. The square of 20, 400, was denoted by a plume; and 8,000, the cube of 20, by a purse or sack. Half or $\frac{1}{4}$ of a plume or a purse represented that proportion of their respective sums, and so of other proportions. The year was divided into 18 months of 20 days each, and both months and days were expressed by peculiar hieroglyphics. Five complementary days were added to make up the 365; and for the fraction over of nearly 6 hours, required to make the full year, they added 18 days at the end of every 52 years. A month was divided into 4 weeks of 5 days each. The epoch from which the Mexicans computed their chronology corresponded with the year 1091 of the Christian era. They had no astronomical instruments except the dial, but their skill in the science of astronomy is shown by their knowledge of the true length of the year, of the cause of eclipses and of the periods of the solstices and equinoxes, and of the transit of the sun across the zenith of Mexico.—Agriculture was in a tolerably advanced state, the land being well managed and irrigated by canals. Granaries of admirable construction were provided to receive the harvests. The articles chiefly cultivated were the banana, the cacao, the fruit of which furnished chocolate, the vanilla, and maize, from whose stalks they manufactured sugar. From the maguey or Mexican aloe they obtained a paste by bruising the leaves, of which they

made paper, while its juice was fermented into *pulque*, an intoxicating beverage. Of the minerals, the Mexicans worked mines of silver, lead, tin, and copper, but were ignorant of the use of iron, for which they found a substitute in an alloy of tin and copper, with which they cut the hardest stones and gems. They cast also vessels of gold and silver, which they carved in a very delicate manner. Of *istli* or obsidian, a dark, transparent, and exceedingly hard mineral, they made knives and swords. For the ordinary purposes of domestic life they made utensils of earthenware and cups and vases of wood, gaudily painted. Among their dyes was the cochineal, with which they gave a brilliant color to cotton cloth. From a species of caterpillar they obtained a kind of silk. But their most peculiar and beautiful manufacture was feather work. The gorgeous plumage of tropical birds was pasted on fine cotton webs, with such taste and skill as to make garments of unequalled beauty and magnificence. There were no shops in the cities, their place being supplied by great markets which were held every fifth day under the inspection of officers appointed for the purpose. The different trades were arranged into something like guilds, and though the distinction of caste was unknown, it was usual for the son to follow the occupation of the father. Trade was held in high estimation, and merchants often attained to high political influence. Women were treated with tenderness and consideration. Polygamy was confined to the wealthy. Marriage was made with religious formalities, and its obligations were held to be strictly binding on both parties. The women partook equally with the men in social festivities and entertainments, and passed their time at home in such feminine occupations as spinning and embroidery. The feasts of the Mexicans were often large and costly, and sometimes, especially at those of a religious character, cannibalism was practised, a slave on such occasions being sacrificed and served up. "That such usages should have existed with the degree of refinement they showed in other things," says Prescott, "is almost inconceivable. It can only be explained as the result of religious superstition. . . . The Aztec character was perfectly original and unique. It was made up of incongruities apparently irreconcilable. It blended into one the marked peculiarities of different nations, not only of the same phase of civilization, but as far removed from each other as the extremes of barbarism and refinement. It may find a fitting parallel in their own wonderful climate, capable of producing on a few square leagues of surface the boundless variety of vegetable forms which belong to the frozen regions of the north, the temperate zone of Europe, and the burning skies of Arabia and Hindostan."—Such was the condition of the Mexicans when, in the summer of 1518, a Spanish squadron commanded by Juan de Grijalva discovered their country, which was then ruled by Montezuma II., who had been

elected emperor 16 years before, and had distinguished himself by energy, enterprise, and extensive conquests in Central America. In November of the same year Hernan Cortes sailed from Cuba on the enterprise which resulted in the conquest of the empire by the Spaniards. (See CORTES.) From 1535 to 1808 Mexico was governed by Spanish viceroys, who succeeded each other to the number of 56, of whom only one, Don Juan de Acuña, marquis de Casa Fuerte, was born in America. He was a native of Peru, and governed Mexico from 1722 to 1734, with a reputation for ability and integrity. The most distinguished of the viceroys was the count de Revilla-Gigedo, whose administration lasted from Oct. 17, 1789, to July 11, 1794. Under his direction good roads leading from the capital in various directions were laid out, the principal cities were paved and lighted and a good police formed in them, and many other practical improvements of importance were carried into effect. By the Spanish colonial system the viceroy of Mexico possessed all the powers of royalty, checked only by the dread of the investigation into his conduct which might be made after his return to Spain, and by the authority of the *audiencia* or court of appeal of Mexico, a highly influential body, which corresponded directly with the king and the council of the Indies, and whose sanction was necessary to give the viceregal decrees the force of law. The viceroy, however, was president of the *audiencia*, and its members, though independent in theory, were in practice generally subservient to his wishes. All official posts in Mexico were filled by Spaniards, and the colonial offices were regularly sold in Madrid to the highest bidder. To keep the native Mexicans in ignorance, almost every kind of useful learning was prohibited to them. Their industry and the material development of the country were hampered by severe restrictions. They were not allowed to cultivate flax, hemp, saffron, the olive, the vine, or the mulberry, and they were forbidden to manufacture any thing which could be supplied by the mother country. For a long time foreign trade was prohibited on pain of death. In addition to these injurious and degrading restrictions for the selfish interest of Spain, the Mexicans were heavily taxed and subjected to all the evils of an arbitrary government and a corrupt and partial administration of justice. The news of the invasion of Spain by the French in 1808, and the proclamation of Joseph Bonaparte as king, was received with great indignation in Mexico, and with manifestations of the most ardent loyalty to Ferdinand VII. The viceroy at this period was Don José Iturrigaray, who endeavored to form a provisional government partly composed of natives; but the Spaniards in the capital, averse to allowing the Mexicans any share in the administration of public affairs, armed themselves, and, seizing the viceroy in his palace on the night of Sept. 15, 1808, sent him a prisoner to Spain, and assumed

themselves the reins of government. This proceeding, and the conduct of the new viceroy Venegas, who brought from Spain rewards and distinctions for the leaders of the revolt against his predecessor, and who persecuted those who had supported the plan of a provisional government, alienated and incensed the natives. A conspiracy was formed, and in Sept. 1810, a revolt broke out in the province of Guanajuato, headed by a priest, Don Miguel Hidalgo, who possessed considerable talent and had much influence among the Indian part of the population. This insurrection, which aimed at driving the Spaniards from Mexico, soon assumed formidable proportions, Hidalgo having at one time 100,000 men under arms. After his defeat and death in 1811, the contest was continued by Morelos, also a priest, who called a national congress, which met at Chilpanzingo, Sept. 13, 1813, and on Oct. 18 declared Mexico independent. On Oct. 22, 1814, it promulgated at Apatzingan a constitution which is known by the name of that place. After several defeats Morelos was captured, carried to the city of Mexico, and executed as a rebel, Dec. 22, 1815. For several years subsequently the contest became a mere partisan warfare on the part of the patriots, of whom the principal chiefs were Victoria, Guerrero, Bravo, Rayon, and Teran. These were gradually driven from the field, and were killed, imprisoned, or obliged to hide like wild beasts in the mountains, till at the beginning of 1820 the authority of Spain appeared to be fully re-established in Mexico. But in the course of that year the news of the revolution in Spain, and of the proclamation of the constitution which Ferdinand VII. had been compelled to adopt, renewed the agitation among the Mexicans in favor of a liberal government. Don Augustin Iturbide, a native Mexican and an officer of the army, who during the recent civil war had distinguished himself on the royalist side, now threw off his allegiance and began the second revolution by proclaiming Mexico independent, Feb. 24, 1821, and, proposing a constitution known as the "plan of Iguala," from its promulgation at the town of that name. The principal points of this "plan" were the recognition of Roman Catholicism as the national creed, the abolition of all distinctions founded on caste or color, and the establishment of a constitutional monarchy, the crown to be offered to Ferdinand VII., and if refused by him to the infantes Don Carlos and Don Francisco de Paula. The revolt of Iturbide was eminently successful. In the course of a few months the whole country recognized his authority except the capital, and by a treaty signed at Cordova, Aug. 24, 1821, with the viceroy, Don Juan O'Donoghue, he obtained possession of the capital on Sept. 27, and instituted a regency of which he was the head. Eight months later, with the support of the army and the mob of the city of Mexico, Iturbide was proclaimed emperor, on the night of May 18, 1822, under the title of Augustin I. His reign lasted but 10

months, a successful insurrection commenced by Santa Anna at Vera Cruz compelling him to abdicate, March 20, 1828. A provisional government, at the head of which were Generals Victoria, Bravo, and Negrete, was now appointed; and a congress having assembled, a federal constitution similar to that of the United States was promulgated, Oct. 4, 1824, by which Mexico was formed into a republic with 19 states and 4 territories. Gen. Vittoria was elected president and Gen. Bravo vice-president, for a term of 4 years. In 1828 Gen. Gomez Pedraza was elected president by the votes of the party called *Escoscos* or *Scots*, over Gen. Guerrero, the candidate of the *Yorkinos* or *Yorkists*. These names were taken from rival masonic associations, one of which derived its origin from the grand lodge of Scotland, and the other from that of York, England. The electoral majority for Pedraza was only two, and the partisans of Guerrero declared that the election had been carried against them by fraud and corruption, and rose in insurrection under the lead of Santa Anna. A sanguinary revolution ensued, during which the Spaniards, of whom a considerable number still resided in Mexico, and who generally sympathized with the party of the *Escoscos*, were plundered by the mob and driven from the country. Pedraza resigned his claim to the presidential office in Jan. 1829, and Guerrero was declared duly elected, and entered upon the office on April 1. In the following summer the country was invaded by a Spanish army under Gen. Baradad, which landed at Tampico July 27, but was compelled to surrender to Gen. Santa Anna on Sept. 10. Guerrero on the approach of the invaders had been invested with dictatorial powers, and his persistence in exercising them after the defeat of the Spaniards furnished a pretext to Bustamante and Santa Anna for exciting a revolt and marching upon the capital with the troops from Vera Cruz. Guerrero was compelled to resign, and the army elected Bustamante to the vacant office. A few months later Guerrero attempted by force to regain the presidency, but was captured and executed, Feb. 14, 1831. Revolutions now followed in rapid succession, until in 1838 Santa Anna became president, and Bustamante and his principal adherents were sent into exile. Congress now passed laws abrogating the authority of the pope over the Mexican church, suppressing the convents, and abolishing the compulsory payment of tithes. It also proposed to appropriate the property of the church to the payment of the national debt, but this measure led to insurrections and to further complications, which ended in 1835 in the abrogation of the constitution of 1824 and the conversion of the confederation of states into a consolidated republic, of which Santa Anna was nominally constitutional president, and practically dictator. This revolution was acquiesced in by all parts of the country except Texas, where several thousand Americans had settled as colonists. The refu-

sal of the Texans to submit to the centralized government, which they pronounced a usurpation and its chief a dictator, induced Santa Anna to march against them in the beginning of 1836 with an army, which was defeated and annihilated at San Jacinto, April 21, the Mexican president himself being taken prisoner. In the previous month a convention of delegates assembled at the town of Washington had declared Texas an independent republic. The captivity of Santa Anna threw Mexico again into confusion. Bustamante became president from April 19, 1837, to March 18, 1839, when he was succeeded by Santa Anna, who, after a visit to President Jackson at Washington, had been sent back to Mexico in a U. S. ship of war in 1836. He held the office as provisional president till July 10, 1839, when Nicholas Bravo became president for a week. A long period of confusion followed, during which the constitution was suspended and the government became a dictatorship, at the head of which were successively Santa Anna, Bravo, and Canälizo, from Oct. 10, 1841, to June 4, 1844. Constitutional government was resumed in 1844 with Santa Anna as president, under a constitution promulgated June 12, 1843. He was deposed and banished by a revolution, and was succeeded, Sept. 20, 1844, by Canälizo, who was deposed by a revolution, Dec. 6 of the same year. His successor, Herrera, was also driven from office by a revolution, Dec. 30, 1845, when he was succeeded by Gen. Paredes, under whose administration war commenced with the United States by conflicts on the Rio Grande between the Mexican army under Gen. Ampudia and the army of Gen. Taylor. During the war various revolutions occurred, in one of which Santa Anna, whose return from exile had been connived at by the American government, regained the supreme power, which he made use of to carry on the struggle against the Americans with vigor. He was defeated by Gen. Taylor at Buena Vista, and by Gen. Scott at Cerro Gordo and in several battles in the vicinity of Mexico city; and the treaty of Guadalupe Hidalgo, by which, in Feb. 1848, the war was closed and New Mexico and California ceded to the United States, was followed by his forced retirement to Jamaica, and the elevation of Herrera to the presidency under the federal constitution of 1824, which had been reestablished in 1846. Herrera was succeeded, Jan. 15, 1851, by Gen. Arista, who, on Jan. 5, 1853, was compelled by a revolution to resign. By a decree issued March 17, 1853, Santa Anna was recalled, and for the 5th time was placed at the head of the government, April 20, with the title of president, but with unlimited powers. He endeavored to make his rule perpetual, and was suspected of a design to convert the republic into a monarchy. Juan Alvarez, governor of the state of Guerrero, "the panther of the Pacific," began an insurrection against the dictator at Acapulco, Jan. 22, 1854, which received the coöperation of Haro y Tamariz, Comonfort, Degollado, and

other eminent men, and resulted in the flight of Santa Anna from the country in Aug. 1855, and the elevation of Gen. Carrera to the presidency, which he held for 27 days, being compelled to retire Sept. 12. After 3 weeks of anarchy, Alvarez was made president by a junta, and held the office from Oct. 4 to Dec. 11, when he retired and delegated his authority to Comonfort. The latter soon took active measures against the influence of the clergy, who were strongly opposed to his administration. On March 31, 1856, he confiscated by a decree the property of the church, and on June 28 issued another forbidding the clergy to hold real estate. These proceedings led to revolts in the latter part of the year, but they were promptly suppressed. Congress, on March 11, 1857, promulgated a new constitution, which greatly restricted the power of the president. The army was opposed to this constitution, and in Jan. 1858, a revolution broke out which soon terminated in the resignation of Comonfort and the elevation of Gen. Zuloaga to the presidency, by the conservative party. According to the provisions of the constitution, by the resignation of President Comonfort his office devolved on Benito Juarez, chief justice of the supreme court, who was supported by the liberal party and by the greater part of the country, while the conservatives held Mexico and a few other cities. Juarez assembled an army to maintain his right, but was defeated by Zuloaga and retired to Panama, whence he proceeded to Vera Cruz and established himself there, May 4, as constitutional president. Subsequently Zuloaga was deposed by Gen. Robles, who made a futile effort to unite the liberals and conservatives. Gen. Miramon then became chief of the conservatives, and the civil war between him and the leaders of the liberals still continues (Sept. 1860).

MEXICO, a state of the Mexican republic, between lat. $18^{\circ} 30'$ and $21^{\circ} 57'$ N., and long. 98° and 101° W., bounded N. by the state of Queretaro, N. E. by Vera Cruz, E. by Puebla, S. W. by Guerrero, and W. by Michoacan; area, 19,535 sq. m.; pop. 1,002,044. It lies entirely on the high table land, and has a mountainous surface, including several volcanoes and the peak of Toluca, which reaches the region of perpetual snow, 15,000 feet above the sea. The finest portion of the state is the great valley of Mexico, which is oval in form and about 200 miles in circumference. The soil of the state is remarkable for its fertility, and produces in abundance every variety of plants. To the N. E. of the great valley is a rich silver mining district, and there are also valuable mines of iron, lead, and carbonate of soda. Beside Mexico city, the federal capital, around which there is a small district under the exclusive jurisdiction of congress, the chief towns are Lerma, Chalco, San Augustin, Cuernavaca, and Toluca, the state capital, which is about 27 m. S. W. of the federal metropolis.

MEXICO, a city and the capital of the republic of Mexico, situated about $2\frac{1}{2}$ m. W. of Lake Tex-

cuco, in the valley of Mexico, in lat. $19^{\circ} 25' 45''$ N., long. $108^{\circ} 45' 30''$ W., 7,400 feet above the level of the sea; pop. estimated at 200,000. The present city of Mexico occupies a part only of the site of the ancient city destroyed by Cortes, and is consequently much smaller than the capital of the Montezumas. It is, however, a large and splendid city, inferior to none in the world in the magnificence of its appearance and site. Humboldt, who visited Mexico in 1808, calls it one of the finest cities ever built by Europeans. He states that he had seen successively within a short space of time Lima, Mexico, Philadelphia, Paris, Rome, Naples, and the largest cities of Germany; and yet, on comparing the impressions made by them, he says that Mexico had left on his mind a recollection of distinguishing grandeur, which he attributes in part to the majestic character of its situation and the surrounding scenery. A recent French traveller, J. J. Ampère, says: "Mexico is a grand city in the Spanish style, with an air more imposing, more majestic, more metropolitan than any city of Spain except Madrid. Crowned by numerous domes and steeples, and surrounded by a vast plain bounded by mountains, Mexico reminds one somewhat of Rome. Its long streets, broad, straight, and regular, give to it an appearance like Berlin. It has also some resemblance to Naples and Turin, yet with a character of its own. It makes one think of various cities of Europe, while it differs from each of them. It recalls all and repeats none." The city forms a square, and the streets intersect each other at right angles. The squares thus formed are of nearly equal dimensions throughout the city, and have each a distinct appellation, no street having the same name in its whole extent. The houses are generally 3 stories high, and massively built of stone, without intervening spaces, each block forming one compact structure. In the interior of each house is a *patio* or court, which communicates with the street by a door large enough to admit a coach. From the *patio* stairs lead to the upper stories and to the roof, which is flat and enclosed by an ornamental iron balustrade. The Plaza Mayor, or great square, is in the centre of the city, and covers an area of 12 acres paved with marble. On the N. side of this square stands the cathedral, 500 feet in length and 420 in breadth. It was 94 years in building, from 1573 to 1667, and occupies the site of the principal temple of the ancient city. Its appearance is imposing, though the architecture is an irregular mixture of the Gothic and the Italian style. The front is decorated with carving, and there are two towers of considerable height ornamented with statues. The interior is rich and gorgeous, and the numerous crucifixes, candlesticks, reliquaries, &c., of gold and silver adorned with jewels, are said to be of immense value. Within the enclosure of the cathedral is a remarkable stone called the "stone of sacrifice," which is of porphyry about 9 feet in diameter, and is covered with sculptures; it is supposed to have

been used by the ancient Mexicans for the sacrifice of human victims. In the wall of the cathedral is a stone called the Aztec calendar, also of porphyry, and weighing about 24 tons; it is circular in form, and is covered with hieroglyphics representing the months of the year. On the E. side of the Plaza Mayor is the national palace, formerly the palace of the Spanish viceroys. This is a fine edifice, nearly square, with a front of several hundred feet, and in the interior 4 large square courts. It is the official residence of the president, and contains also the halls of congress, the mint, two prisons, and many public offices, together with several shops. At the S. E. corner of the great square is the city hall, which contains also the merchants' exchange. The rest of the square is surrounded by private dwellings. The university, the school of sciences, and an extensive market occupy considerable buildings near the square. There are beside the cathedral about 60 churches and convents, most of them large and richly ornamented. The Acordada is a vast and strong prison, which will contain 1,200 convicts. The Plaza de Toros is an arena for the exhibition of bull fights, which will accommodate nearly 8,000 spectators. The city contains several *portales*, or covered colonnades, lined with shops, which form favorite promenades, especially in the evening. There is at the W. end a park of about 12 acres, called the Alameda or public walk, which has many fine trees. On the same side of the city is a *paseo* or promenade, $1\frac{1}{2}$ m. in length, planted with double rows of trees. Two aqueducts supply Mexico with water, one of which, upward of 6 m. in length, extends from Santa Fé to the Alameda, and is supported for one third of its course on arches. The southern suburbs are supplied by the aqueduct of Chapultepec, which is upward of 2 m. long. The most important manufactures of the city are those of tobacco, gold and silver lace, plate, jewelry, soap, and coaches. The commerce of Mexico, however, is small, and it is supported chiefly by the presence of the government. The markets are well supplied with fruits and vegetables, comprising the best productions of the temperate and torrid zones, from gardens on islands in the adjacent lakes, and with beef, mutton, pork, poultry, and game.—The population of Mexico is of a singularly varied character, about $\frac{1}{2}$ consisting of whites of Spanish descent, $\frac{1}{4}$ of Indians, and $\frac{1}{4}$ of mestizoes, mulattoes, zamboes, negroes, and foreigners of nearly all nations. Though many families possess immense wealth, the mass of the people are poor; and the lowest class of all, the *leperos*, are remarkably idle, squalid, and vicious, resembling in character as well as in number the *lazzaroni* of Naples.—The chief historical interest of Mexico is based upon its identity of site with the ancient city, the capital of the Montezumas. The Aztecs or ancient Mexicans, after their migration from the north, wandered for a long time in the Mexican valley, till in 1325 they halted on the S. W. borders of the lake of Tez-

cucuo, and there beheld one morning an eagle of extraordinary size perched on the stem of a cactus growing out of a rock, with a serpent in his talons, and his wings spread to the rising sun. An oracle announced the omen as auspicious, and as indicating the site of their future metropolis; and they began its foundations by sinking piles into the marshes on which they erected huts of reeds and rushes. They called the place Tenochtitlan, "cactus on a stone," in allusion to the omen. Its name of Mexico was subsequently derived from that of their god Mexithi. By the middle of the 15th century the city had become large and prosperous, and reeds and rushes were supplanted by stone and lime; and when on the evening of Nov. 7, 1519, its long lines of glittering edifices first met the eyes of the followers of Cortes, it looked, says Prescott, like a thing of fairy creation rather than the work of mortal hands. On their entry into Mexico next day the Spaniards found fresh cause for admiration in the grandeur of the city and the superior style of its architecture. The great avenue through which they marched was very wide, and extended straight through the heart of the city. It was lined with the houses of the nobles, built of a red porous stone drawn from quarries in the neighborhood. The flat roofs were protected by stone parapets, so that every house was a fortress. Occasionally a great square or market place intervened, surrounded by porticoes of stone and stucco; occasionally a pyramidal temple of colossal size, crowned with tapering sanctuaries and blazing altars. But what most impressed the Spaniards was the throngs of people who swarmed through the streets, filling every doorway and window and clustering on the roofs. Nothing certain, however, is known of the amount of its population. "No contemporary writer," says Prescott, "estimates it at less than 60,000 houses, which, by the ordinary rules of reckoning, would give 800,000 souls. If a dwelling often contained, as is asserted, several families, it would swell the amount considerably higher. The concurrent testimony of the conquerors; the extent of the city, which was said to be nearly 8 leagues in circumference; the immense size of its great market place; the long lines of edifices, vestiges of whose ruins may still be found in the suburbs, miles from the modern city—all attest the numerous population far beyond that of the present capital." Though a few of the streets were wide and of great length, most of them were narrow and lined with mean houses. The great streets were intersected by numerous canals crossed by frequent bridges. The palace of Montezuma was near the centre of the city, and was a pile of low irregular stone buildings, so vast that one of the conquerors says, although he had visited it more than once for the express purpose, he had been too much fatigued each time by wandering through the apartments ever to see the whole of it. Another palace, assigned to Cortes on his entrance into the city, was so large as to accommodate his whole army. But

the most remarkable edifice of the city was the great *teocalli* or temple, which had been completed and dedicated in 1486. It stood in the midst of a vast area encompassed by a stone wall about 8 feet high, ornamented on the outer side by figures of serpents in bass-relief. This wall was pierced on its 4 sides by gateways opening on the 4 principal streets. Over each of the gates was an arsenal, and there were barracks near the temple garrisoned by 10,000 soldiers. The temple itself was a solid pyramidal structure of earth and pebbles, coated externally with hewn stones. It was square, its sides facing the cardinal points, and was divided into 5 stories, each of which receded so as to be smaller than that below it. The ascent was by a flight of steps on the outside, so contrived that to reach the top it was necessary to pass 4 times round the whole edifice. There were 114 steps, and the base of the temple is supposed to have been 800 feet square. The summit was a large area paved with broad flat stones. On it were two towers or sanctuaries, and before each an altar on which burned a fire that was never suffered to go out. The view from this summit, as seen by the Spaniards on their first visit, is thus described by Prescott: "Below them, the city lay spread out like a map, with its streets and canals intersecting each other at right angles, its terraced roofs blooming like so many parterres of flowers. Every place seemed alive with business and bustle; canoes were glancing up and down the canals; the streets were crowded with people in their gay, picturesque costume; while from the market place a confused hum of many sounds and voices rose upon the ear. They could distinctly trace the symmetrical plan of the city, with its principal avenues issuing as it were from the 4 gates of the temple, and connecting themselves with the causeways, which formed the grand entrances to the capital. They could discern the insular position of the metropolis, bathed on all sides by the salt floods of the Tezcuco, and in the distance the clear fresh waters of the Chalco; far beyond stretched a wide prospect of fields and waving woods, with the burnished walls of many a lofty temple rising high above the trees, and crowning the distant hill tops. The view reached in an unbroken line to the very base of the circular range of mountains, whose frosty peaks glittered as if touched with fire in the morning ray; while long dark wreaths of vapor, rolling up from the hoary head of Popocatepetl, told that the destroying element was indeed at work in the bosom of the beautiful valley." The police of the city was efficient and vigilant; and 1,000 men were daily employed in watering and sweeping the streets. As the lake that surrounded the city was extremely brackish, pure water for the supply of the people was brought by an aqueduct from the neighboring hill of Chapultepec, where Montezuma had a summer palace surrounded by vast and magnificent gardens. In the final siege by the Spaniards, Cortes, despairing of otherwise sub-

duing a place where every house was a fortress and every street was cut up by canals, reluctantly determined to destroy the city, which he calls "the most beautiful thing in the world." With the aid of his multitudinous Indian allies, whose hatred of the Aztecs led them to work with zeal, in a few weeks seven-eighths of the city was levelled to the ground, and the canals filled with the rubbish. Soon after the termination of the siege Cortes began to rebuild the city on its present plan, assembling for the work a host of Indians, estimated by one Mexican writer at the incredible number of 400,000. During its occupation by the Spaniards, from 1521 to 1821, the most remarkable events in the local history of Mexico were 5 great inundations in 1553, 1580, 1604, 1607, and 1629, caused by the overflowing of the neighboring lakes. To prevent the recurrence of these inundations a great drain was dug through the hill of Nochistongo, by which the waters of the river Guantitlan were led out of the valley instead of falling into the lake of Tezcuco. This work, which was upward of 100 years in process of construction, is about 12 miles long, from 100 to 180 feet deep, and between 200 and 300 feet wide. It was completed in 1789. Since the republic was established, the city of Mexico has been the scene of several revolutions and insurrections, and a number of important battles have been fought in the vicinity. The most noted of these were the battles of Churubusco and Contreras, Aug. 20, 1847, and of Chapultepec, Sept. 13, fought between the American army commanded by Gen. Scott, and the Mexican army commanded by Gen. Santa Anna. The latter battle was followed by the occupation of the city, on Sept. 14, by the Americans, who held it till it was evacuated in compliance with the treaty of Guadalupe Hidalgo, which was ratified in May, 1848.

MEXICO, GULF OF, a basin of the Atlantic ocean enclosed by the United States, the West Indies, and Mexico, and measuring about 1,000 m. from E. to W. and 800 from N. to S.; estimated area, 800,000 sq. m. The states of Florida, Alabama, Mississippi, Louisiana, and Texas border upon it on the N., and the Mexican states of Tamaulipas, Vera Cruz, Tehuantepec, Tabasco, and Yucatan on the W. and S. Its entrance, between Cape Sable at the extremity of the peninsula of Florida, and Cape Catoche at the extremity of the peninsula of Yucatan, is about 500 m. in width; but midway across this mouth lies the island of Cuba, leaving a passage on either hand, viz.: the strait of Florida on the N. E., 120 m. wide, communicating with the Atlantic, and the channel of Yucatan on the S. W., communicating with the Caribbean sea, 105 m. wide. West of Yucatan extends the broad bay of Campeachy; on the coast of Texas are the bays of Corpus Christi, Aransas, Matagorda, and Galveston; in Louisiana are those of Vermilion, Atchafalaya, Barataria, Black, and Lake Borgne; in Alabama Mobile bay, in Mississippi Mississippi sound, and in Florida Pensacola harbor, Appalachicola, Appalachee, Tampa, and

Charlotte bays, and the bay of Ponce de Leon. Beside these, the coasts, being mostly low and marshy or sandy, are lined with numerous lagoons. There are few islands except some small ones belonging to Yucatan, a number near the delta of the Mississippi, and the Florida keys. The most important rivers of the gulf are the Suwannee and Appalachicola in Florida; the Mobile in Alabama; the Pascagoula and Pearl in Mississippi; the Mississippi in Louisiana; the Sabine, Trinity, Brazos, Colorado, Nueces, and Rio Grande in Texas; and the Tampico in Mexico. These streams are nearly all obstructed by bars at their mouths, and there are very few good harbors; Havana, Mobile, Galveston, and Vera Cruz are the most important.—The depth of the gulf is believed not to exceed three quarters of a mile. The officers of the U. S. ship *Albatross* ran a line of deep-sea soundings across the gulf from W. to E., and reported a maximum depth of 6,000 feet; but subsequent experiments have led to the belief that it is really not so great. The reefs and shoals on the N. shore of Cuba and about the Florida keys render the passage into the Atlantic exceedingly intricate, but elsewhere there are few banks; the only large one lies about lat. 27° N., long. 86° W., 200 m. S. from Cape San Blas. Beside the N. E. and S. E. monsoons which prevail in the gulf, it is visited by violent northern gales, called *nortes*, which begin in September or October, and reach their greatest strength in March. They commonly terminate in this month, but sometimes last until April. The most remarkable phenomenon connected with the gulf of Mexico is the Gulf stream (see ATLANTIC OCEAN, vol. ii. p. 298), which enters it by the channel of Yucatan, passes around it, and flows out by the strait of Florida. The temperature of the gulf, owing partly to this great influx of water from the torrid zone and partly to the proximity of the burning *tierras calientes* of Mexico, is about 8° or 9° higher than that of the Atlantic ocean in the same latitude. In its centre are found great quantities of *fucus natans* or gulf weed, floating in parallel lines from S. S. E. to N. N. W.—By some geographers the term gulf of Mexico is applied to all that part of the Atlantic lying W. of the E. extremity of the West India islands, extending therefore from the Bahamas to the Orinoco, and including, beside the gulf proper, the Caribbean sea.

MEYER. I. FELIX, a Swiss painter, born in Winterthur, canton of Zürich, in 1653, died in 1718. He studied painting under Ermels in Nuremberg, and subsequently passed some time in Italy, but returned to Switzerland, and gained a considerable reputation by his views of Swiss scenery. He was employed throughout Germany by princes of the empire and others in ornamenting their apartments. II. JOHANN HEINRICH, a German artist and writer on art, born in Stafa, on the lake of Zürich, March 16, 1759, died in Weimar, Oct. 14, 1832. He was for some time the pupil of J. C. Füssli, the brother of Henry Fuseli, and in 1786 visited

Rome, where he commenced an intimacy with Goethe, which became of so close a character that Meyer was familiarly known in Germany as Goethe-Meyer. In 1797 he established himself in Weimar, and 10 years later was appointed director of the academy of painting in that city, a position which he retained until the close of his life. As a painter his productions were few and of little importance; but he possessed a profound knowledge of the principles and history of antique art, and during his whole residence in Weimar was the consulting oracle of Goethe on the subject. Many portions of Goethe's *Kunst und Alterthum*, *Winckelmann und sein Jahrhundert*, *Farbenlehre*, and other publications on art, are supposed to reflect the opinions of Meyer. Meyer was the principal editor of Winckelmann's works, which were published in Dresden in 1808-'20 in 8 vols., and furnished most of the elaborate notes illustrating them. The latter were afterward rearranged by him in the form of a consecutive history of Greek art, under the title of *Geschichte der bildenden Künste bei den Griechen* (2 vols. 8vo., Dresden, 1824), to which a posthumous volume illustrating the progress of Greek art among the Romans was subsequently added (8vo., Dresden, 1836). III. HERMANN, a German naturalist, born at Frankfort-on-the-Main, Sept. 3, 1801. He was brought up in a banking house, in 1822 studied jurisprudence and chemistry at Heidelberg, and subsequently became a member of the municipal government of his native city and an administrator of the exchequer of the Germanic confederation. Apart from his public duties he has been an enthusiastic student of the natural sciences, and has made several important additions to the literature of geology and palæontology. Since 1845 he has been engaged upon an elaborate work entitled *Zur Fauna der Vorwelt*, which is not yet finished. IV. LUDWIG, a German physiologist, born in Bielefeld, Westphalia, in 1828. He was educated at a Jesuit college in Paderborn, and in 1848 went to the university of Bonn to study medicine. Joining with ardor in the revolutionary movement instigated by Kinkel and others, he was arrested and in 1850 put on trial for his life; but he argued his own case, and was promptly acquitted by the jury. He then repaired to Würzburg to study pathological anatomy, and subsequently pursued the same subject at Berlin under Müller, Reinhart, and others. Receiving in 1853 the appointment of assistant physician in the insane department of the Charité hospital in Berlin, he left his previously chosen field of pathological anatomy and devoted himself exclusively to the study of mental diseases. In 1855-'7 he had the charge of the new insane asylum at Schwetzn in East Prussia, but in 1858 he resumed his post at the Charité, and became also a private instructor at the university of Berlin. In the latter year he published a small work on insanity which led to his appointment as director of the insane department of the hospital at Hamburg, a posi-

tion he still occupies. He traces all mental disease to some disarrangement of the physical system, and divides cases of insanity into two principal classes, one in which the disease is "idiopathic," or emanating from the brain, and the other in which it is "sympathetic" or "reflected,"—that is, the cause is to be sought for in some other part of the body.

MEYERBEER, GIACOMO, a dramatic musical composer, born in Berlin, Sept. 5, 1794. His original name was Jakob Meyer Beer, which he changed for its present form. His parents belonged to a Jewish family distinguished alike for wealth and love of letters and art, and especially of music. His father held a high position in the financial and commercial world of Berlin, and his house became a favorite resort of the artistic, literary, and social celebrities of the Prussian metropolis. These associations and the highly intellectual atmosphere of their domestic life had a happy effect upon the æsthetic development of his children. His younger sons, Michael Beer (died 1838) and Wilhelm Beer (died 1850), both attained to eminence, the former as a dramatic author, the latter as an astronomer. Giacomo, the eldest son, displayed from his earliest childhood remarkable musical capacities, which were assiduously encouraged by those around him. It is said that in his 5th year he used to play little tunes spontaneously on the piano. His first teacher on that instrument was Franz Lanska, a Bohemian by birth, and an artist of some local reputation. In the theories of music he was instructed by Karl Friedrich Zelter, a friend of Goethe, and afterward teacher of Mendelssohn-Bartholdy. His performance on the piano soon elicited general admiration. He preferred, however, to devote himself to the study of dramatic composition. Bernhard Anselm Weber was his first instructor in that branch of the art; but in order to perfect himself in the composition of the fugue, the customary basis of a thorough training in counterpoint and of the art of conducting several themes or melodies in harmonic combination, he required the assistance of a superior master. This he found in Georg Joseph Vogler, who was at that time one of the most eminent scientific musicians and the principal organist of Germany, and who had opened in Darmstadt a school to which only young men of remarkable talent were admitted. Meyerbeer, upon the cordial invitation of Vogler, joined this school in Feb. 1810, and his more scientific musical studies date from that period. While there, he became acquainted with Karl Maria von Weber, who, after having already composed several operas, had resumed his studies at Darmstadt. The two young men, joined by Gänsbacher and other pupils who have since attained to eminence, assembled daily in the rooms of Vogler, where a theme for musical composition was given to each of them, including the professor, which was elaborated during the day and executed in the evening. Meyerbeer and Weber lived together for nearly two years in

the same room, and their intimate relation lasted until the death of the latter composer (1826), who left the last two acts of his opera, "The three Pintos," to be completed by his friend. While in Darmstadt Meyerbeer composed an oratorio, *Gott und die Natur*, which was received with great favor by the grand ducal family, and caused him to be appointed composer to the court. After a course of study for about two years, he set out on the tour of Germany, in company with Vogler, under whose auspices he produced his opera "Jephthah" at Munich in 1812. This, on account of its scientific precision, gave so much satisfaction to his good teacher, that he pronounced him to have reached the climax of musical science, and handed him his official diploma as "maestro." Weber, too, bestowed warm encomiums upon the opera, but the public did not entertain the same views of its merit. "Jephthah" had no elements of popularity, and was considered a failure. Discouraged by this reception, and at the same time impressed by the genius of Hummel, Meyerbeer now made his début as a pianist at Vienna, and with such brilliant success that he seemed destined to eclipse the fame of all contemporary artists. The court of Vienna, however, commissioned him to compose an opera, and he soon produced *Die beiden Khalifen*, which was no more successful than "Jephthah," both operas being totally opposite to the popular taste, which at that time was delighted by the genius of Rossini and Italian music generally. His friend Salieri consoled him, and prevailed upon him to visit Italy. Meyerbeer on his arrival there witnessed the performance of Rossini's "Tancred," and his enthusiasm for the Italian school now became, to the great regret of Weber, as great as his aversion for it had formerly been. Determined to cultivate his taste for melody, in which he had been deficient, he began to imitate the Italian style, and composed in rapid succession a series of operas, which were almost all favorably received. His *Romilda e Costanza* was performed in Padua in 1818; his *Semiramide riconosciuta*, after Metastasio, in Turin in 1819; and his *Emma di Resburgo*, based upon the same subject as Méhul's "Helen," in Venice in 1820, in the same season with Rossini's *Eduardo e Cristina*, the productions of the German and Italian masters receiving the same share of enthusiastic applause, and the former establishing Meyerbeer's fame. This new opera was translated into German and performed in the principal opera houses of his native country. Weber, however, opposing the Italian style adopted by his friend, caused "The Two Caliphs" to be performed at the German theatre of Dresden, while "Emma" was given to full houses in the Italian opera; but subsequently he was the first to bring Meyerbeer's Italian operas upon the stage in Dresden, paying the utmost attention to the *mise en scène*. In the mean time "Emma" had been received with great enthusiasm by the fastidious audiences of the Scala in Milan, and paved the way for the favorable reception there

of his next opera, "Margaret of Anjou" (1822), in which Levasseur made his debut on the Italian stage. This was succeeded by *L'esule di Granata* (1823), the principal parts of which were written for Lablache and Pizaroni. But the procrastination in its performance, which did not take place before the carnival of that year, proved fatal to its reception. The 1st act was hissed, and the 2d act would have shared the same fate if it had not been for a duet admirably sung by Lablache and Pizaroni. Subsequently, however, the opera proved successful. "Almanzor" was also composed in 1822, and intended for the opera of Rome; but owing to the illness of Caroline Bassi, who was to take the principal part, it was never brought out. The *Crociato* was given in Venice at the end of 1825, and at the close of the performance Meyerbeer was called before the curtain and crowned amid the plaudits of the audience. He now made the tour of the different Italian cities, in order to attend personally to the production of his works. The *Crociato* may be taken as the best and most individual of his productions up to that time, the style of which had been marked by a successive improvement. This opera is logically written as regards dramatic harmony, and imitates the vocal Italian phraseology of the period. The melodies are not wanting in artistic perception, and possess the indispensable elements of fluency only found to perfection in the Italian school; yet they are deficient in several respects, and the *Crociato* cannot rank as a work of essential genius. It formed, however, a turning point in Meyerbeer's career, M. de Larochefoucault inviting him to Paris (1826), where the *Crociato* was received with considerable favor.—Paris now became the head-quarters of the composer, but for the first two years of his residence there he was induced to suspend his musical labors by his marriage and by the successive death of two infant children. In 1826 he composed his *Robert le diable*, which he sold in July, 1830, to M. Lubbert, director of the grand opera, and which made the fortune of his successor, M. Véron. After many rehearsals it was at length brought out in Nov. 1831. The excitement which it created was perhaps unparalleled in the history of the Parisian stage. It combined in a singular degree oriental gorgeousness, German thoughtfulness, French vivacity, and Italian brilliancy, and exhibited a breadth and depth of genius for which the preceding works of the composer, with the exception of some parts of the *Crociato*, had hardly prepared the public. The enthusiasm which greeted it in Paris was shared by all Europe, although it found perhaps more admirers in Germany and France than in other countries. The Germans especially were fascinated by an opera which in some respects reminded them of Goethe's "Faust," and which combined in so remarkable a degree the convivial, picturesque, pathetic, and supernatural elements. The chivalric strains of Robert, the touch-

ing Normandy song of Alice, the thrilling scene at the cross between Bertram and Alice, the ghostly effect of the rising of the nuns from the graves, and the pathos and loftiness of the closing act, contained powerful attractions for high and low; the most popular airs were soon transferred from the stage to the streets, and sung in the taverns. Jenny Lind won her brightest laurels in London by her personification of Alice, and Formes invested Bertram with an intellectuality almost equalling that of Mephistopheles. The melodies of "Robert," the best which Meyerbeer has yet produced, are in the main formed upon the style of Rossini, with certain changes. It has Weber's supernaturalism and the developed orchestration of the period, with the extensions proper to a long subject fully handled. The keen and subtle intellectuality of the composer is revealed throughout the whole work in his effort to make it in every sense acceptable to Parisian audiences. Hence his adoption of the extended musico-dramatical form, so popular in France; his attention to effective contrasts and sequences, which the French dramatists and lyrical composers treat with such consummate skill; his introduction of a vast range and variety of scenic accessories; the sonority of the orchestra, so much insisted upon at the grand opera; and the selection of a libretto by Scribe, which rivets the attention of the audience through the whole of 5 long acts, without for a moment abating in interest.—Meyerbeer reached the climax of his fame by his opera *Les Huguenots*. The feelings of enthusiasm which this work elicited on its first appearance in Paris in March, 1836, have been gaining in strength ever since; and even in Berlin, where his productions had been subjected to the adverse criticism of jealous rivals and of antagonistic schools of music, all depreciating voices were hushed by the "Huguenots," and the friends and foes of the composer became for the first time unanimous in their admiration of his genius. The dramatic character of the "Huguenots" is not surpassed by any work of the lyrical stage, and the strife between the great religious parties in France has never before been portrayed with the graphic power and the thrilling effect which characterized its plot. The creation of the character of Marcel, and of the music suitable to it, would have been alone sufficient to immortalize Meyerbeer; but the whole opera abounds with scenes and incidents which hold the senses of the audience captive by the most remarkable instrumental and vocal effects, and which at the same time engross the mind and the imagination by historical associations full of picturesque splendor. The consecration of the poignards and the duet between Raoul and Valentine in the 4th act constitute perhaps the crowning dramatic glory of a work, almost every part of which is crowded with musical, intellectual, and scenic beauties. The "Huguenots" is, above all, to be regarded as one of the first of the operatic achievements which derive their inspiration from the records of his-

tory; and it contributed to inaugurate the era of the lyrico-historic drama, in which the greatest effects of which the musical and dramatic stage and its accessories are capable are used for the purpose of illustrating the most momentous conflicts of mankind. The influence of the "Huguenots," as a herald of this new era of musical art, can perhaps not yet be fully estimated. It invested operatic entertainment with the dignity of the historic muse and the graces of dramatic literature.—Like most great works, those of Meyerbeer require time in their elaboration, and 13 years elapsed before his next opera, *Le prophète*, was ripe for performance. It appeared at length in 1849, and at once took a high place as a worthy successor of the "Huguenots," although of much less imposing character in its historic groundwork and in its general effect. It shows, however, the same largeness of musical and artistic treatment, and as a lyrical drama it derives great beauty from the admirable manner in which the maternal love of Fides is placed in contrast with the religious frenzy of her son, the prophet of Leyden. The scores in this opera, as in Meyerbeer's other works, are wonderful in their elaboration, and may be commended to students for their careful dramatic portraiture, in which the orchestra is made to echo or anticipate the characterization of the scene. The extraordinary labor bestowed upon the *mise en scène* of the "Prophet" has been deemed superfluous by several critics, who regard this excessive elaboration of external effects as derogatory to the genius of the composer and to the intrinsic merits of his works. (See Schladebach, *Meyerbeer's Prophet*, Dresden, 1850).—The "Prophet" has been followed by *Pierre le Grand (L'étoile du nord)*, 1854, and "Dinorah" (*Le pardon de Ploermel*, 1858). The former of these shows the versatility of the author, though its success cannot be compared with that of its great predecessors. "Dinorah," which treats a rustic and pastoral theme, is variously criticized in Europe, and unfavorably as regards melody. Meyerbeer has published a great number of miscellaneous musical compositions, among which are *Le camp de Silésie*, an opera produced at Berlin; a *Stabat*, a *Miserere*, a *Te Deum*, 8 of Klopstock's canticles, &c. One of his most finished artistic efforts is the music which he composed for the drama of "Struensee," by his late brother Michael Beer. Meyerbeer has long been engaged on a new opera, called *L'Africaine*.

MEZERAY, FRANÇOIS ÉLDES DE, a French historian, born at Rye, in Lower Normandy, in 1610, died in Paris in 1688. He served for two campaigns as commissary in the army, after which he wrote his *Histoire de France*, the 1st volume of which appeared in 1648, and the remaining 2 in 1646 and 1651. The king conferred upon the author a pension of 4,000 livres, and the title of historiographer royal; but in 1668 he forfeited his pension by publishing an abridgment of his *Histoire* which contained some severe reflections on French taxation. In

1646 he had been elected a member of the French academy; and in 1675 he became its perpetual secretary. He was a man of eccentric character, writing even at midday and in summer by candle light, and so negligent of his person that on one occasion he was arrested as a pauper. His history of France has been continued down to 1880 (Paris, 1889).

MEZQUITE, the Mexican name of two kinds of shrubs bearing pods filled with pulp. They are leguminous plants in their natural characters, and belong to that vast and highly useful order. The common mezquite is the *algarobia glandulosa* of Dr. Torrey, a small, woody shrub resembling the honey locust, but, unlike it, the stems are often decumbent. It is armed with straight spines an inch or more in length. Its leaves are bipinnate and furnished with minute stipules, the common petioles terminating in a spinular point, a small gland between the basis of the pinnæ; leaflets $\frac{1}{2}$ to 1 inch or more in length, obtuse, mucronate. The pod or legume is about 6 inches long, straight or a little curved, slightly compressed. The pods have been used for food. In dry seasons the mezquite exudes a large quantity of valuable gum, similar to gum Arabic and gum Senegal. This species is described and figured in the "Annals of the Lyceum of New York," vol. ii. p. 192. The curly mezquite (*Stromboscarpa pubescens*, Gray) is also called screw mezquite, screw bean, and tournil. A figure is to be seen in Fremont's "Report" under the name of *prosopis odorata* (Torrey). This shrub is of great value in the wild and desert lands of the far West, as may be noticed in the "Report" of the exploration for a Pacific railroad route, where frequent mention is made of its occurrence near springs of water with willow bushes. It constitutes one of the principal timber trees or shrubs in the Santa Maria valley; and on the route to the Colorado desert the Indian squaws were seen gathering the mezquite beans from the numerous shrubs which there abound. These beans or seeds are ovate, kidney-shaped, compressed, very smooth and hard, with a thin albumen, and are enclosed in pods spirally twisted into compact, rigid cylinders, which are from 1 to 1½ inch long, and the sarcocarp of which is also pulpy and nutritious.

MEZQUITE GUM. See GUM, vol. viii. p. 569.

MEZZOFANTI, GIUSEPPE GASPARDO, an Italian linguist, born in Bologna, Sept. 17, 1774, died in Rome, March 15, 1849. He was originally destined for his father's trade, that of a carpenter; but while attending one of the free schools of the Fathers of the Oratory in Bologna, a priest of the congregation observed his precocious talents, and enabled him to be educated for the church, and he was ordained in 1797. He was gifted with an extraordinary memory, and before the close of his university career had made himself master of the Latin, Greek, Hebrew, Arabic, Coptic, Spanish, French, German, and Swedish languages. At the age of 28 he was appointed professor of Arabic at Bologna; but on the annexation of that city to

the Cisalpine republic, he was removed from his professorship for refusing to take the oaths to the new constitution. After the conclusion of the concordat between Pius VII. and Napoleon, Mezzofanti was restored to the university, and named professor of oriental languages. The suppression of his professorship in 1808 reduced him to great distress, leaving him mainly dependent for his own support and that of his sister's children on the precarious income derived from private tuition. The wars of which N. Italy was so long the theatre had afforded him many opportunities of extending his knowledge as a linguist. In the hospital of Bologna, to which he had attached himself as volunteer chaplain, were to be met invalids from most of the countries of central and eastern Europe—Germans, Hungarians, Bohemians, Wallachs, Servians, Russians, Poles, and Croats; and while ministering to these, he acquired by conversation with them a knowledge of their respective languages. He was also in the habit of repairing to the hotels whenever strangers arrived, for the purpose of studying the peculiarities of their phraseology and pronunciation. In 1812 he was appointed assistant librarian, and in 1815 head librarian of the university of Bologna. After the conclusion of peace, his reputation as a linguist rapidly extended. Mr. Stewart Rose reported that, in 1817, he could read 20 languages, and write 18. Lord Byron, whom he is said to have beaten in talking English slang, pronounced him a monster of languages, a Briareus of parts of speech, and a walking polyglot. Lady Morgan, in 1822, stated that rumor ascribed to him the knowledge of 40 languages, though his own modesty claimed only a superficial acquaintance with that number. Having gone to Rome in 1832 as one of a deputation sent by the Bolognese to congratulate Gregory XVI. on his election, he was induced by the pope to settle there, and to accept a prebend in the church of St. John Lateran. This appointment he soon after exchanged for a canonry in St. Peter's, and in 1833 he succeeded Angelo Mai as chief keeper of the Vatican library, an office which he held till 1838, when conjointly with Mai he was elevated to the cardinalship. His residence in Rome gave a new impulse to his linguistic studies. To his former acquisitions he here added a knowledge of Irish, Welsh, Lappish, Sanscrit, Persian, Georgian, Armenian, Chinese, and several Hamitic tongues, all of which he is said to have spoken with extraordinary precision and fluency. His familiarity with the dialectical varieties and local idioms of the principal languages, as well as with their respective literatures, and his power of instantly passing from one to another in conversation, were almost incredible. At the time of his death he is said to have been acquainted with 114 languages. Mezzofanti never held any office of state, and though a learned theologian and canonist, he is almost unknown as an author, his only published work being a panegyrical "Mémorial of Father Emanuel da Ponte," a friend

and brother professor (Bologna, 1820). He was a man of great virtue and modesty, open-hearted, amiable, and remarkably abstemious. His life has been written by O. W. Russell, D.D., principal of Maynooth college, (London, 1858).

MEZZOTINTO. See ENGRAVING, vol. vii. p. 210.

MIAKO, the ecclesiastical capital of Japan, and residence of the mikado or nominal emperor, situated in the S. W. part of the island of Nippon, in lat. 35° 6' N., long. 135° 38' E., 250 m. W. S. W. from Yeddo. It lies in a well cultivated plain in the province of Yamato, and is surrounded by hills from which spring many small rivers, and on whose declivities are magnificent temples and vast gardens. The city is 4 m. in length and 3 in breadth. Three shallow streams, the largest of which is the outlet of the lake of Oizumi, enter on its E. side, and in the middle unite to form one river, over which near the place of junction there is a bridge 600 feet in length; the united stream flows through the city and passes out on the W. side. The streets are narrow and straight, crossing each other at right angles. The houses are two stories in height, and are built of wood, plaster, and clay, with shingled roofs. In the western quarter is a large castle built of freestone, in which a garrison is always maintained. In the city and its neighborhood are numerous temples and monasteries, the former being the most magnificent in Japan. Don Rodrigo de Vivero, the Spanish governor of Manila, who visited Miako in 1608, was told that it then contained 5,000 temples. He describes one in which was an immense bronze image of Buddha, the construction of which was begun by the tycoon in 1602. He says: "I ordered one of my people to measure the thumb of the right hand; but although he was a person of the ordinary size, he could not quite encircle it with both arms. But the size of the statue is not its only merit; the feet, hands, mouth, eyes, forehead, and other features are as perfect and as expressive as the most accomplished painter could make a portrait. When I first visited this temple it was unfinished; more than 10,000 men were daily employed upon it. The devil could not suggest to the emperor a surer expedient to get rid of his immense wealth." This colossus was injured by an earthquake in 1662, after which it was melted down and a substitute prepared of wood gilded. Kämpfer, who was at Miako in 1691, describes the temple which contained this image as enclosed by a high wall of freestone, some of the blocks of which were 12 feet square. A stone staircase of 8 steps led up to the gateway, on either side of which stood a gigantic image 24 feet high with the face of a lion, but otherwise well proportioned, black and almost naked, and placed on a pedestal 6 feet high. Within the gateway were 16 stone pillars on each side for lamps, and on the inside of the enclosing wall was a spacious gallery covered with a roof supported by two rows of pillars 18 feet high and 12 feet distant from each other.

Opposite the gateway in the middle of the court stood the temple, much the loftiest structure which Kämpfer had seen in Japan, with a double roof supported by 94 immense wooden pillars, 9 feet in diameter. The floor of the temple was paved with square flags of marble. There was nothing inside but the great image of Buddha sitting on a *terete* or lotus flower, supported by another flower of which the leaves were turned upward, the two being raised about 12 feet from the floor. The idol was gilt all over, had long ears, curled hair, and a crown on the head which appeared through the window over the first roof of the temple. The shoulders were so broad as to reach from one pillar to another, a distance of 80 feet. In front of this temple is an edifice containing a bell, which is described in the Japanese guide books as 17 feet 2½ inches high, and weighing 1,700,000 Japanese catties, equal to 2,066,000 lbs. English, a weight 5 times greater than that of the famous bell at Moscow. Kämpfer, however, who had seen the great bell at Moscow, describes this Japanese bell as inferior in size to that, and as being rough, ill cast, and ill shaped. It was sounded by striking it on the outside with a large wooden mallet. Another temple, dedicated to Quanwon, was very long in proportion to its breadth. In the centre was a gigantic image of Quanwon, with 86 arms. Sixteen black images larger than life stood round it, and on each side two rows of gilt idols with 20 arms each. On either side of the temple, running from end to end, were 10 platforms rising like steps one behind the other, on each of which stood 50 images of Quanwon as large as life—1,000 in all, each on its separate pedestal, so arranged as to stand in rows of 5, one behind the other, and all visible at the same time, each with its 20 hands. On the heads and hands of all these are placed smaller idols to the number of 40 or more. The whole number of images is stated by the Japanese to be 33,000.—The N. E. quarter of Miako is the residence of the emperor of Japan, the *dairi* or *mikado* as he is called. This quarter is of great extent, and is separated from the rest of the city by a wall and ditch. It comprises about a dozen streets, in which dwell the officers and attendants of the imperial court, and a vast multitude of persons who all claim to be of imperial blood, and to be descended from Syn Mu, the first of the emperors. Many of these nobles, however, are extremely poor, and support themselves by various handicrafts. All the revenues of Miako and its 5 dependent provinces are assigned to the support of the mikado and his court; and the tycoon, the real ruler of the empire, makes for the same purpose an annual allowance from the treasury at Yeddo. From the latest accounts, however, it appears that the court of the mikado is often reduced to great straits for want of money. Miako is the principal manufacturing and commercial city of Japan. Money is coined there, and there are extensive works in copper, iron, and other metals, particularly

in steel, the best tempered sword blades and other arms being made here. The city is famous also for its manufacture of gold and silver stuffs, rich dresses, furniture, toys, carvings, musical instruments, pictures, and books. It is the centre of the internal trade of the empire, which is carried on here by means of great fairs, at which immense quantities of tea, silk goods, porcelain, rice, lacquered ware, and other commodities are sold. Miako is also the chief seat of learning and literature, most of the books in circulation in the empire being written and printed here. The people are noted for their intelligence and polished manners, and at the same time for their profligacy.—We have no recent statement of the population. According to Kämpfer, the result of a census in his day was a total population of 529,720, of whom 52,169 were ecclesiastics. The number of houses was 138,979, and there were 1,858 streets, 87 bridges, and 137 palaces. There is reason to believe that its present population (1860) is not far from 1,000,000.

MIALL, EDWARD, an English reformer and journalist, born in Portsmouth in 1809. He was educated at the Protestant dissenters' college at Wymondley, Herts, and for several years officiated as an Independent minister at Ware and Leicester. In 1841 he established the "Nonconformist" newspaper in London, in the interests of the "anti-state-church" party, and has since continued to be its editor and proprietor. After several unsuccessful attempts to enter parliament, he was returned for Rochdale in 1852, but lost his seat in the general election of 1857, and has not since been a member. He has published the "Nonconformist's Sketch Book," and "The British Churches in relation to the British People," in which his opposition to ecclesiastical establishments and endowments is vigorously expressed.

MIAMI. I. A W. co. of Ohio, intersected by the Miami river and drained by its branches; area, about 400 sq. m.; pop. in 1850, 24,996. The surface in the E. part is rolling and in the W. more level, and the soil very fertile. The productions in 1850 were 1,129,456 bushels of Indian corn, 222,122 of wheat, 163,987 of oats, and 71,430 lbs. of wool. There were 28 grist mills, 39 saw mills, 2 iron foundries, 3 woollen factories, 10 tanneries, 48 churches, and 10,579 pupils attending public schools. It is intersected by the Miami and Erie canal, and by the Columbus and Indianapolis and the Dayton and Michigan railroads, the latter passing through the capital, Troy. II. A N. co. of Ind., intersected by the Wabash and Eel rivers; area, 384 sq. m.; pop. in 1850, 11,304. It has a generally level surface, with elevations near the streams, and a fertile soil. The productions in 1850 were 548,338 bushels of Indian corn, 114,454 of wheat, 29,569 of oats, and 17,511 lbs. of wool. There were 10 grist mills, 13 saw mills, 4 tanneries, 13 churches, and 2,500 pupils attending public schools. The Toledo and Wabash railroad intersects the county, passing through the capi-

tal, Peru, which is connected with Indianapolis by the Peru and Indianapolis railroad.

MIAMI, a river of Ohio, which rises in Hardin co., and flowing S. and S. W. for a distance estimated at 150 m., passing Troy, Dayton, and Hamilton, falls into the Ohio river at the S. W. corner of the state, 20 m. W. of Cincinnati. It is a rapid stream, passing through a picturesque and fertile country, and admits of navigation for only a portion of its length. Its principal branches are the West branch, the Mad and the Whitewater rivers. The Miami canal runs along the river for about 70 miles, and together they furnish extensive power for manufacturing purposes.—This river is sometimes called the Great Miami, in distinction from the Little Miami, which rises in Madison co., and after a S. W. course of about 100 m., nearly parallel to the former, falls into the Ohio 6 m. E. of Cincinnati. It is skirted for the greater part of its course by the Little Miami railroad, connecting Xenia and Cincinnati.

MIAMI UNIVERSITY, a seat of learning at Oxford, Butler co., Ohio, 33 m. N. W. from Cincinnati. In 1788 J. C. Symmes purchased from the United States 1,000,000 acres of land, bounded S. by the Ohio river, E. by the Little Miami, and W. by the Great Miami. One condition of this purchase was, that a full township, 6 miles square, should be set apart "for the endowment of an academy and other seminaries of learning." This condition was not complied with; but as the prospect of the establishment of a university within the bounds of Symmes's purchase had induced many to settle there, in 1803 congress ceded to the state of Ohio the township of Oxford, to be held in trust for educational purposes. The university was incorporated in 1809. The lands are leased for 99 years (renewable for ever without revaluation), subject to an annual quitrent of 6 per cent. on the purchase money, and yield an income of nearly \$6,000. The government of the institution is vested in a board of 18 trustees, appointed by the governor of the state with the consent of the senate, for the term of 9 years, 6 of whom retire every third year. The faculty consists of a president and 7 instructors. There are 4 college buildings: one 86 by 60 feet and 3 stories high, with a wing 40 feet square; the other 2 are each 100 by 40 feet, and 3 stories high. These buildings are plain, old-fashioned, and substantial structures, situated in a field of 60 acres shaded by the native forest. A grammar school was commenced in 1813, and in Nov. 1824, the college was opened under the presidency of the Rev. R. H. Bishop, D.D., a graduate of Edinburgh university. Dr. Bishop resigned in 1840, and served as professor of history till 1845. He was succeeded in the presidency by the Rev. George Junkin, D.D., previously president of Lafayette college, Penn., and now of Washington college, Va. He resigned in 1844, and was succeeded by the Rev. E. D. McMaster, D.D.; on whose resignation in 1849, the Rev. W. C. Anderson, D.D., was ap-

pointed, who was succeeded in 1854 by the Rev. J. W. Hall, D.D. The first class, consisting of 12 members, was graduated in 1826; the whole number of graduates up to 1859 was 674, of whom nearly one third have entered the ministry. The number of students in 1859 was 127. The library contains 7,500 vols.

MIASMA. See MALARIA.

MICA (Lat. *mico*, to shine), in mineralogy, the name of a group of the silicates, distinguished by their remarkable lamellar structure, the elasticity of their laminae, and their half metallic lustre. The mineral crystallizes in right rhomboidal prisms of 120° , which separate with the greatest facility in folia parallel with the base of the crystal. These may be subdivided till many thousand plates are required to make the thickness of an inch. The plates are sometimes found of an area of several square feet. They are usually transparent, elastic, and tough. The colors are various; the most common are silvery white, grayish green, red, and black. The hardness of the mineral is 2 to 2.5; specific gravity 2.65 to 3. The different species are distinguished partly by their different optical characters as well as by their differences of composition. They present 2 axes of double refraction, which, in the species designated by Dana as muscovite, and commonly known as Muscovy glass, vary in apparent inclination between 44° and 75° ; in the phlogopites, called also rhombic mica and magnesia mica in part, from 5° to 20° ; and in the biotites below 5° . Prof. B. Silliman, jr., observes that the muscovites are confined to granitic and other igneous rocks, and the phlogopites to granular limestone and serpentine. The former generally contain potash or lithia and little magnesia, and the latter contain magnesia, and often but little alkali. The composition of the most common micas, according to Dufrenoy, is from 45 to 50 per cent. of silica, 32 to 33 of alumina, 10 to 12 of alkali (rarely soda), and 2 to 4 of fluoric acid. He considers the differences of composition too great to admit of any general formula. The micas are silico-fluates, containing, beside silica and fluorine, alumina, iron, magnesia, potash, and lithia, the magnesia generally failing in the varieties found in the granitic rocks. Lepidolite is a species distinguished for its occurrence usually in granular masses made up of foliated scales of rose-red color, violet gray, yellowish, or whitish. Muscovite, the most familiar form of mica, is a constituent of granite, gneiss, mica slate, and some other kindred rocks. It is found both disseminated and in veins, and in many of the stratified rocks it is an incidental constituent derived from the destruction of the original formations to which it belonged. The mineral is thus seen to be very generally distributed; but certain localities are distinguished for the production of large plates of it. In Siberia they have been found more than 3 feet across, and they have been obtained of great size in Sweden and Norway. This is also the case at Acworth, Grafton, and Alstead, N. H.; and mica has also been

found in some of the other states and in Canada sufficiently large to be quarried for economical purposes. Mica is used mostly for the doors of stoves and the sides of lanterns, for which it is well adapted by its transparency and refractory character. It has been employed as a substitute for window glass, and its toughness recommends it for this purpose on board vessels of war, in which the concussion from the discharge of heavy guns would endanger the fracturing of glass. It is also serviceable for holding small objects for microscopic examination. The value of good plates is about \$1 per lb.

MICA SLATE, a rock consisting of mica and quartz, and sometimes feldspar, in which the mica predominates, and by its arrangement in parallel planes gives to the aggregate a foliated structure.

MICAH, one of the 12 minor prophets, who, according to the testimony of his book (i. 1), prophesied in the days of Jotham, Ahaz, and Hezekiah, kings of Judah (759-699 B. C.). He was a native of Moresheth of Gath. The prophecy of Micah consists of two parts, the first of which terminates with chapter v. It begins with a sublime theophany, the descent of the Lord to judge the nations of the earth, and then predicts the captivity of Israel, the fall of Judah, the destruction of Jerusalem, the expatriation of the Jews, their future return, and the celebrity of the temple of Zion. Other bloody and glorious wars are seen in the perspective, and after many calamities a ruler is seen to come forth from Bethlehem (v. 2), which is one of the most important prophecies, regarded from a theological point of view. The second part consists of a dialogue or contest between the Lord and his people. The style of Micah is sublime and vehement, and in this respect he is not inferior to any other prophet of the Old Testament. One of the principal works on Micah is that of Caspari, *Micah der Moraschite und seine prophetische Schrift* (Christiania, 1851).—Micah, or Micaiah, was also the name of another prophet mentioned in the history of Ahab, king of Israel.

MICHAEL (Heb., who is as God?), the angel who had special charge of the Israelites as a nation (Dan. x. 13, 28), who disputed with Satan about the body of Moses (Jude 9), and who with his angels carried on war with Satan and his angels in the upper regions (Rev. xii. 7-9). The Jews regarded Michael as one of the archangels, and the Christian church early adopted this view. The representation of Michael, sword in hand, conquering the dragon, became a favorite symbol in the Roman Catholic church. A festival of St. Michael was introduced as early as 480 by Pope Felix, and it was retained also in the Lutheran church. Mohammedans regard Michael likewise as one of the archangels, and as guardian angel of the Jews.

MICHAEL ANGELO. See **ANGELO**.

MICHAELIS, JOHANN DAVID, a German biblical scholar and critic, born in Halle, Feb. 27, 1717, died in Göttingen, Oct. 22, 1791. He was

graduated at the university of his native city in 1739, visited England, and in 1743 returned to Halle, and began to deliver lectures on the historical books of the Old Testament. In 1745 he was appointed professor extraordinary, and soon after regular professor of philosophy at Göttingen. For nearly 20 years he edited the *Göttinger gelehrte Anzeigen*. His principal works are: a translation of the Hebrew Bible; "Introduction to the New Testament," translated into English by Bishop Marsh; and *Das Mosaische Recht* (2d ed., 5 vols., Göttingen, 1776-'89), translated into English by Dr. Alexander Smith, under the title of "Commentaries on the Laws of Moses," in 1814.

MICHAELMAS, the feast of St. Michael the Archangel, Sept. 29. It is more celebrated for popular customs connected with it than for any peculiar religious observance. It was an old custom in England to mark the day by electing civil magistrates, perhaps in allusion to the analogy between the superintendence of magistrates and that of guardian angels, of whom St. Michael was reputed the prince. A more famous custom is that of eating roast goose, the origin of which has long exercised the wisdom of antiquaries. The traditional Michaelmas goose has been traced at least as far back as the 10th year of Edward IV.; and it is said that one of the strongest objections of the English commonalty to the reformation of the calendar was based on the confusion which would follow if Michaelmas day was not celebrated when stubble geese are in their highest perfection. There is an old proverb: "If you eat goose on Michaelmas day, you will never want money all the year round."

MICHATOYAT, Rio. See **GUATEMALA**, vol. viii. p. 540.

MICHAUD, JOSEPH, a French poet and historian, born at Albens, Savoy, June 19, 1767, died in Passy, Sept. 30, 1839. He commenced his literary career in Paris in 1791 by the publication of a *Voyage littéraire* to Mont Blanc and the adjoining regions, followed by an oriental tale entitled *Origine poétique des mines d'or et d'argent*, neither of which attracted much notice. He next became a defender of the monarchy; and for publishing an anti-revolutionary satire entitled *Déclaration des droits de l'homme*, he was obliged for a time to conceal himself. In Sept. 1792, he established *La quotidienns*, a daily journal in the royalist interest, the character of the articles in which caused him to be arrested and condemned to death. The efforts of his friend Giguet preserved him from the guillotine, and he was executed in effigy only. Adhering steadily to his opinions under the directory, he was banished after the 18th Fructidor (Sept. 4, 1797), and took refuge among the Jura mountains, whence after a two years' exile, he returned to France in Nov. 1799. Among the fruits of his absence was a poem, the *Printemps d'un proscrit* (Paris, 1803), which went through many editions. He opposed the consulate with no less acrimony than he had

attacked the convention and the directory, and for an anonymous pamphlet, the *Adieux à Bonaparte* (Paris, 1800), he was confined for a short time in the Temple. In 1801 appeared his first historical work, *Histoire des progrès et de la chute de l'empire de Mysore, sous le règne d'Hyder Ali et de Tippe Saïb* (2 vols. 8vo.), followed in the succeeding year by the *Biographie moderne* (4 vols. 8vo., Leipsic), printed in Paris by the brothers Michaud, a publishing firm established at the commencement of the century by himself, his brother Louis Gabriel, and Giguet. This publication was the germ of the later and more elaborate work, the *Biographie universelle*, published by the same house. His royalist views meanwhile began to yield to the force of circumstances, and in 1811 he addressed a congratulatory poem to Napoleon on occasion of his marriage to Maria Louisa, under the title of *Fragment d'un troisième livre de l'Énéide*, and another in 1812 commemorating the birth of the king of Rome. The year 1812 witnessed the appearance of the 1st volume of his most important work, the *Histoire des croisades*, which went through 5 editions in his lifetime, the last being in 1838 (6 vols. 8vo.), has been translated into the principal languages of Europe, and is an enduring monument of his industry and ability. He published an abridgment of it (2 vols. 12mo., 1838), and in further illustration of the subject produced the *Bibliothèque des croisades* (4 vols.), and *Correspondance d'Orient* (7 vols.), the latter being a record of his extensive travels in company with his pupil, Poujoulat, through those portions of the East traversed by the crusaders. After the overthrow of the empire Michaud reestablished the *Quotidienne*, but during the Hundred Days it lost its original character, and became a mere vehicle of news. He subsequently published an account of the Hundred Days, of little historical value, which passed through 27 editions, and continued until the close of his life, in spite of feeble health, to devote himself to historical researches. Among his last publications were an edition of Hénault's *Abrégé chronologique de l'histoire de France*, with a continuation to July, 1830, and a *Collection de mémoires pour servir à l'histoire de France*, which was commenced in 1836, in conjunction with Poujoulat, and published in 34 vols. 8vo. The work, however, with which his name has been most popularly associated, is the *Biographie universelle*, published between 1811 and 1828, and which, with its supplement, 1834-'40, comprises 85 vols. 8vo. He was a member of the French academy and of the academy of belles-lettres, and held other positions of honor and emolument.—LOUIS GABRIEL, brother of the preceding, born in Bourg-en-Bresse in 1772, died at Ternes, near Paris, in March, 1858. He accompanied his brother to Paris, and with him founded the publishing house of Michaud brothers, from which have issued some of the most important historical and biographical works of the century. Of the *Biographie universelle*,

which has been sometimes termed the *Biographie Michaud*, a considerable portion was written by him, and he subsequently carried on a successful edit against the Messrs. Didot, who had appropriated the title to their work, since named *Biographie générale*, now in course of publication. In 1854 a new and greatly enlarged edition of the *Biographie universelle* was commenced under the auspices of M. Michaud, which is nearly half completed. He published in addition a *Tableau historique et raisonné des premières guerres de Bonaparte*, and a variety of notes and prefaces to books edited by him.

MICHAUX, ANDRÉ, a French botanist, born near Versailles, March 7, 1746, died in Madagascar in 1802. After enriching the *jardin des plantes* with many specimens collected during expeditions in England, the Pyrénées, and Spain, he was sent to Persia in 1782 by Monsieur, afterward Louis XVIII. In the "garden of Semiramis" near Bagdad he discovered a Persepolitan monument, which he sent to the cabinet of antiquities in the royal library at Paris. Returning to France with a valuable botanical collection, he was commissioned by the government in 1785 to make a journey through North America. He traversed a great part of the continent from Florida to Hudson's bay, established botanical gardens in Charleston and New York, and collected and sent home an immense quantity of plants and seeds. The government allowance for the expense of this undertaking having ceased at the revolution, he made use of his private purse until it was exhausted. On his voyage home he was shipwrecked and lost all that he possessed except 4 cases of specimens. In 1800 he joined the expedition to New Holland under Capt. Baudin, but left it at the Isle of France, and went to Madagascar. He left a *Histoire des chênes de l'Amérique Septentrionale* (fol., Paris, 1801), and *Flora Borealis Americana* (2 vols. 8vo., 1808).—FRANÇOIS ANDRÉ, a French botanist, son of the preceding, born in Versailles in 1770. He was employed by the French government on a scientific mission to North America, to decide what species of the forest trees of that country might profitably be introduced into Europe, and made 8 voyages to the United States, whence he sent to France large quantities of valuable seeds. His principal work is the "History of the Forest Trees of North America" (3 vols. 8vo., Paris, 1810-'13), of which an English translation was published in Philadelphia in 1817 in 5 vols. 8vo., with 160 colored engravings. He also published a treatise "On the Naturalization of Forest Trees in France" (8vo., Paris, 1805), "Journey to the West of the Alleghany Mountains" (8vo., Paris, 1804; London, 1805), and "A Notice of the Bermudas" (4to., Paris, 1806).

MICHEL, FRANÇOISQUE, a French author and archæologist, born in Lyons, Feb. 18, 1809. He commenced his literary career in Paris as a writer for the journals, and in 1832 published two historical novels. His chief attention, how-

ever, was given to philological researches, and between 1830 and 1838 he edited a number of publications written in mediæval French, including *La chronique de Du Guesclin*, *Les chansons de Coucy*, *Le lai d'Havelock le Danois*, &c. In 1835 he was commissioned by Guizot, then minister, to make researches into early French history and literature among the libraries of England, and in 1839 he was appointed professor of foreign literature in the faculty of Bordeaux. Between 1834 and 1842 he published in London or Paris upward of 30 works in French, Saxon, or English, written between the 11th and 14th centuries, many of which were then printed for the first time. Among the most important from an archæological point of view are: the "Romance of Eustache Le-moine" (8vo., 1834); "Tristan" (2 vols. 12mo., London, 1835); "Anglo-Norman Chronicle" (8 vols. 8vo., Rouen, 1836-'40), illustrating the history of England and Normandy during the 11th and 12th centuries; the "Song of Roland" (8vo., 1837); "Chronicle of the Dukes of Normandy" (4 parts, 1837-'40), by the troubadour Bénéoit; "Song of the Saxons" (2 vols. 8vo., 1839-'40), a narrative of the life of Wittekind; and "History of the Dukes of Normandy and the Kings of England" (8vo., 1840). He has also produced several original works of considerable erudition, including his *Histoire des races maudites de la France et de l'Espagne* (2 vols. 8vo., 1847); *Le livre d'or des métiers* (2 vols. 8vo., 1851-'4); *Histoire des tissus de soie au moyen âge* (2 vols. 4to., 1852-'4), &c. His last work, *Le pays Basque* (Paris, 1858), has great merit.

MICHELET, JULES, a French historian and miscellaneous writer, born in Paris, Aug. 21, 1798. He is the son of a printer, who zealously provided for his education, and he studied with brilliant success in the collège Charlemagne under Villemain and Leclerc. After travelling in Germany, he was called in 1821 to the chair of history in the collège Rollin, where he was also professor of the ancient languages and of philosophy till 1826, publishing in the period his *Tableau chronologique de l'histoire moderne* (1825) and *Tableaux synchroniques de l'histoire moderne* (1826). In 1827 he was made *maître des conférences* in the normal school, and after the revolution of 1830 received the desirable appointment of chief of the historical section of the archives of France. In that year Guizot, who was diverted from literature to politics, chose him to continue his lectures in the faculty of letters. His reputation was extended by a series of historical works, which secured to him admission in 1838 to the college of France and to the academy of moral sciences. Among his publications were: *Précis de l'histoire moderne* (1828), a work which has become a classic in France, and passed through more than 20 editions; *Introduction à l'histoire universelle* (1831); a translation of Vico's *Scienza nuova*, under the title of *Principes de la philosophie de l'histoire* (1831); *Histoire Romaine* (1831); and *Mémoires de Luther* (1833), consisting al-

most entirely of passages from Luther's writings. In 1833 appeared the first portion of his most important work, not yet completed, the *Histoire de France*. His academical lectures had meantime become distinguished for appeals in favor of democratic ideas and for assaults upon the society of Jesuits, against whom he waged a violent warfare. He embodied these tendencies in 8 books: *Des Jésuites* (1848), in collaboration with Quinet; *Du prêtre, de la femme et de la famille* (1844); and *Du peuple* (1846). No professor of history in the college of France ever attracted a more numerous and sympathetic audience, and the government of Louis Philippe, regarding his attacks on the established order as dangerous, suspended his course. He was restored to his chair after the revolution of 1848, again declined public office as he had done in 1830, and gave to his lectures the design and character of democratic propagandism, till his course was closed by the government of Louis Napoleon in March, 1851. He lost his place in the archives after the *coup d'état* of Dec. 2, 1851, by refusing to take the oath. He published the *Procès des templiers* (2 vols., 1841-'52), a collection of unprinted documents; *Origines du droit Française cherchées dans les symboles et formules du droit universel* (1837), founded on Grimm's work on German antiquities; and *Précis de l'histoire de France jusqu'à la révolution Française* (7th ed., 1842). Since his retirement, he has been a second time married, has continued his historical labors, and has published a series of volumes entitled *L'oiseau* (1856), *L'insecte* (1857), *L'amour* (1858), and *La femme* (1859), remarkable for their poetical and suggestive speculations. The two last, in which physiology and sentiment are oddly intermingled, have been translated into English by J. W. Palmer, M.D. (New York, 1859 and 1860). The last volume of his *Histoire de France* (1860) extends to the revocation of the edict of Nantes. The *Histoire de la révolution Française* (6 vols., 1847-'53), and *Les femmes de la révolution* (2d ed., 1855), form distinct works. His more important publications have all appeared in English. As a historian he excels in picturesqueness of style, in sudden dramatic effects, and in striking though sometimes fantastic generalizations.

MICHELET, KARL LUDWIG, a German philosopher, born in Berlin, Dec. 4, 1801. He belongs to a family exiled from France by the revocation of the edict of Nantes, and was educated in the gymnasium founded by the French colony and in the university of Berlin, where he received the degree of Ph.D. in 1824. The principles contained in his inaugural dissertation were subsequently developed in his *System der philosophischen Moral* (Berlin, 1828). In 1825 he was appointed to the professorship of philology and philosophy in the French gymnasium, which he held for 25 years; and in 1829 he became professor of philosophy also in the university of Berlin. He devoted himself especially to the doctrines of Aristotle, and published *Die*

Ethik des Aristoteles (Berlin, 1827), an edition of the Nicomachean ethics with a Latin commentary (2 vols., 1829-'33), and a memoir entitled *Examen critique du livre d'Aristote, intitulé Métaphysique* (Paris, 1836), which was crowned by the academy of moral and political sciences of Paris. From 1832 to 1842 he was engaged as one of the editors of Hegel's works, in illustration of whose system he wrote *Geschichte der letzten Systeme der Philosophie in Deutschland von Kant bis Hegel* (2 vols., Berlin, 1837-'8); *Entwicklungsgeschichte der neuesten Deutschen Philosophie mit besonderer Rücksicht auf den gegenwärtigen Kampf Schellings mit der Hegelischen Schule* (1843); and a controversial dissertation, *Schelling und Hegel* (1839). In 1840 appeared his *Anthropologie und Psychologie*, in which in many respects he diverged from Hegelian principles. His own standpoint and tendency are most decisively shown in his *Vorlesungen über die Persönlichkeit Gottes und die Unsterblichkeit der Seele, oder die ewige Persönlichkeit des Geistes* (1841); and *Die Epiphanie der ewigen Persönlichkeit des Geistes* (1844-'52). In the latter, the 3 parts of which he terms a trilogy, he regards the personality of the absolute, the significance of the historical Christ, and the immortality of the soul, as different views of one and the same question. In 1848-'9 he engaged in the discussion of political affairs.

MICHIGAN, one of the western states of the American Union, and the 18th admitted under the federal constitution, situated between lat. 41° 40' and 48° 30' N., and long. 82° 25' and 90° 34' W. It is bounded N. by Lake Superior, which separates it from British America; E. by St. Mary's strait, or river, Lake Huron, St. Clair river, Lake St. Clair, the Detroit river, and Lake Erie; S. by Ohio and Indiana; and W. by Lake Michigan and the Menomonee and Montreal rivers, with the chain of lakes lying between their head waters. The land area of the state is 56,248 sq. m., or 85,995,520 acres, being 1.91 per cent. of the total area of the United States. Beside 19 unorganized it has 54 organized counties, viz.: Allegan, Alpena, Bay, Barry, Berrien, Branch, Calhoun, Cass, Cheboygan, Chippewa, Clinton, Eaton, Emmet, Genesee, Grand Traverse, Gratiot, Hillsdale, Houghton (including Isle Royale), Huron, Ingham, Ionia, Iosco, Isabella, Jackson, Kalamazoo, Kent, Lapeer, Lenawee, Livingston, Macomb, Manistee, Manitowish, Marquette, Mason, Mecosta, Michilimackinac, Midland, Monroe, Montcalm, Muskegon, Newaygo, Oakland, Oceana, Ontonagon, Ottawa, Saginaw, Sanilac, Shiawassee, St. Clair, St. Joseph, Tuscola, Van Buren, Washtenaw, Wayne. The principal cities and towns are Lansing, the capital, Detroit, the chief seat of commerce, Ann Arbor, the seat of the state university, Grand Haven, Grand Rapids, Jackson, Kalamazoo, Mackinaw, Marshall, Pontiac, Sault Ste. Marie, and Ypsilanti.—The results of the U. S. census enumerations of the population of Michigan have been as follows:

| Census years. | White persons. | Colored persons. | Total population. |
|---------------|----------------|------------------|-------------------|
| 1810..... | 4,618 | 144 | 4,762 |
| 1820..... | 8,591 | 305 | 8,896 |
| 1830..... | 31,246 | 298 | 31,544 |
| 1840..... | 311,560 | 707 | 312,267 |
| 1850..... | 395,071 | 2,598 | 397,669 |
| 1860..... | | | 751,956* |

A state enumeration in 1854 gave 508,394 white and 3,326 colored; total, 511,720. Decennial increase, 1810-'20, 86.81 per cent.; 1820-'30, 255.65; 1830-'40, 570.9; 1840-'50, 87.34; 1850-'60, 89.21. Density to the square mile in 1850, 7.07; ratio to the total population of the United States, 1.71 per cent. Density to the square mile in 1860, 18.54. In 1850, the white population consisted of 208,465 males and 186,606 females, whose ages were as follows: under 1 year, 10,824; 1 and under 5, 59,615; 5 and under 10, 59,231; 10 and under 15, 49,581; 15 and under 20, 42,454; 20 and under 30, 68,677; 30 and under 40, 51,152; 40 and under 50, 34,221; 50 and under 60, 18,068; 60 and under 70, 8,579; 70 and under 80, 2,793; 80 and under 90, 556; 90 and under 100, 67; 100 and upward, 7; unknown, 120. Deaf and dumb, 124; blind, 125; insane, 132; idiotic, 186. Born in the state, 137,637; in other states, 201,586; in foreign countries, 54,598; and in parts unknown, 1,255. Of the colored population (blacks 1,465, and mulattoes 1,118), 1,431 were males and 1,152 females. The number of dwellings was 71,616; of families, 72,611. Births of all classes, in 1849-'50, 10,898 (2.74 per cent.); marriages, 4,257 (1.07 per cent.); deaths, 4,515 (1.14 per cent.). Of the total population in 1850, 341,591 (85.91 per cent.) were natives, 54,852 (18.79 per cent.) foreigners, and 1,211 (0.30 per cent.) of origin unknown. Of the native-born, 140,648 were born in Michigan, 133,756 in New York, 14,677 in Ohio, 11,118 in Vermont, 9,452 in Pennsylvania, 8,167 in Massachusetts, and 6,751 in Connecticut; and of the foreign-born, 13,430 were born in Ireland, 10,747 in England and Wales, 2,361 in Scotland, 10,281 in Germany, 2,542 in Holland, and 945 in France. Of the male population of the state over 15 years of age (108,978) there were employed in commerce, trade, manufactures, mechanic arts, and mining, 22,875; in agriculture, 65,815; in labor not agricultural, 15,662; in the army, 143; in sea and river navigation, 1,220; in law, medicine, and divinity, 2,007; in other pursuits requiring education, 1,092; in government civil service, 387; in domestic service, 220; and in other occupations, 167. The number of persons employed in manufacturing establishments was 9,290.—Michigan consists of two irregular peninsulas which are separated from each other by the upper ends of Lakes Michigan and Huron. The upper or northern peninsula comprises about $\frac{1}{4}$ of the area of the state, and is bounded N. by Lake Superior, E. by St. Mary's strait, which divides

* Population of two counties estimated.

it from Canada, S. by Lakes Huron and Michigan, and S. W. by Wisconsin. From its N. W. extremity the Lake Superior shore trends N. E. for a distance of about 160 m. to the end of Keweenaw point, a long peninsula running out into the lake. On the E. side of this point is Keweenaw bay. Thence to White Fish point the coast line presents a regular undulation with scarcely any good harbors. At White Fish point it bends sharply to the S. and afterward to the E., enclosing with the Canada shore the deep basin known as Tequamenon bay, from the head of which flows St. Mary's strait. At the mouth of this strait lie several islands, Drummond's island, which belongs to Michigan, being of considerable size. The Lake Huron shore, extending thence westward to the straits of Mackinaw, is much broken and lined with islets; it is separated from Lake Michigan by the peninsula called Pointe St. Ignace. The shore of Lake Michigan is irregular, but offers no large inlets until Green bay is reached, which opens from the N. W. corner of the lake. More than half of the N. and W. shore of this bay belongs to Michigan, and just within its mouth are two inlets extending northward called the Big and Little bays des Noquets. The general aspect of the northern peninsula is rugged and picturesque. The Porcupine mountains, which form the dividing ridge between the waters of Lake Superior and those of Lake Michigan, are about 2,000 feet high on the W. boundary, and run E., broken here and there by extensive valleys, and throwing off spurs, which in some cases extend to the N. shore. The mountains are succeeded by a succession of plains and hills, which gradually extend into an elevated table-land, and finally into an undulating country, sloping on either hand toward the lakes. The greater portion of this region is occupied by vast forests, and much of the remainder by sandy plains. The northern peninsula contains most of the mineral wealth of the state, but its soil is generally sterile. The southern peninsula is in nearly every respect a contrast to the northern. It lies between Lakes Huron and Michigan, and is bounded on the S. E. by the St. Clair river, Lake St. Clair, Detroit river, and Lake Erie. The Lake Huron shore is broken by Thunder bay toward the N., and Saginaw bay near its centre. There are also several inlets on Lake Michigan, the chief of which are Great and Little Traverse bays. The surface is generally level, although in the S. there is an irregular cluster of conical hills from 30 to 200 feet high. A low watershed, culminating at an elevation of 600 or 700 feet, passes through the country from S. to N., much nearer the E. than the W. shore, with a very gradual and almost unbroken slope toward Lake Michigan, except near Au Sable river, where it partakes of a rugged character. The shores on both sides are in many places steep and elevated, and on Lake Michigan especially there are numerous bluffs and sand hills from 100 to 300 feet in height. The soil of the southern peninsula is luxuri-

antly fertile.—The principal rivers of Michigan are the Ontonagon and Tequamenon, flowing into Lake Superior; the Sheboygan, Thunder Bay, Au Sable, and Saginaw, into Lake Huron; the Raisin, into Lake Erie; and the St. Joseph, Kalamazoo, Grand, Muskegon, and Manistee, into Lake Michigan. Most of these are small, but the streams are so numerous that all parts of the state are abundantly watered. Many small ponds are also scattered over the surface.—The most important mineral resources of Michigan have already been particularly noticed in the articles COAL, COPPER, and IRON. The lower peninsula is composed wholly of groups of the Appalachian series of rocks, the highest of which, the coal formation, occupies the central portion of the country, from which the streams flow on one side into Lake Huron, and on the other into Lake Michigan. Though this is the most elevated portion of the peninsula, the surface is little more than moderately rolling, the strata are horizontal, and the bituminous coal beds lie mostly too low to be worked without raising the water by pumping. The coal field is open to Lake Huron by Saginaw bay, the shores of which are mostly in this formation. It extends as far S. as Jackson, on the line of the Michigan central railroad, where a bed 4 feet thick is opened and worked 90 feet below the surface. From the difficulty of obtaining the coal in large quantities, but little of it is shipped, and even the supplies for the Lake Superior iron works are carried chiefly from eastern Ohio. Around the coal field the underlying carboniferous limestone crops out in a narrow belt, and contains in some localities gypseous shales and some plaster of Paris. To this succeeds the wider outcrop of the slates and sandstones of the Portage and Chemung groups, which stretch along the shores of both Lake Michigan and Lake Huron. The limestones and other strata of the Helderberg and Niagara groups surround these, sweeping around into northern Ohio and Indiana, and eastern Wisconsin, and forming the island of Mackinaw and the point of the peninsula S. of this island. The mineral productions found in these formations are of no great importance. The limestones give fertility to the soil, and are abundantly supplied for all the purposes they can serve. From the shores of Lake Huron, near Thunder bay, an excellent stone is quarried for grindstones; and near Saginaw bay salt water is obtained by boring, and under the bounty of 10 cents per bushel, offered by the legislature in 1859 for the salt thus produced, it is expected that this business will be extensively prosecuted. The northern peninsula of Michigan is for the most part composed of the azoic formations, designated by the Canadian geologists the Laurentian and Huronian; the former comprising the various metamorphic slates and gneiss rocks, and the latter the overlying slates and sandstones, which by many geologists had previously been referred to the lowest of the palæozoic formations. With the lat-

ter are found intercalated masses of trap, and with these the great veins of copper for which the Lake Superior region is particularly distinguished. With the former, the range of which is S. of the copper region, and also to the east of it, are found the immense bodies of magnetic and specular iron ores, an account of which is given in the article IRON. In this and COPPER are contained the statistics of the metallic production of the state, which, of no importance 10 years ago, already gives to Michigan a front rank in this branch of industry among the states of the Union.—The climate of Michigan is one of extremes, but much tempered by the proximity of the lakes. That of the southern peninsula is comparatively mild, while that of the northern, especially in the winter season, is cold and rigorous. The mean annual temperature at Detroit (lat. 42° 20', elevation 580 feet) from 1836 to 1854 was 47.25°; and at Fort Brady (lat. 46° 30', elevation 600 feet) from 1823 to 1854, 40.37°. These results illustrate the isothermal conditions of the two peninsulas, the difference in annual heat being nearly 7° F. The mean distribution of the heat to the seasons in the same years was as follows:

| Places. | Spring. | Summer. | Autumn. | Winter. |
|-----------------|---------|---------|---------|---------|
| Detroit..... | 45.89° | 67.60° | 48.67° | 28.34° |
| Fort Brady..... | 37.60° | 62.01° | 43.54° | 18.81° |

At Detroit the greatest difference in the monthly mean in any one year was 49.97° (21.95° to 71.92°), and at Fort Brady 57.81° (18.19° to 71°). The average annual rain fall at the two places was 30.07 and 31.35 inches respectively, and in the seasons as follows:

| Places. | Spring. | Summer. | Autumn. | Winter. |
|-----------------|---------|---------|---------|---------|
| Detroit..... | 8.57 | 9.29 | 7.41 | 4.86 |
| Fort Brady..... | 5.44 | 9.97 | 10.76 | 5.13 |

It is evident from these facts that the upper portion of the state is beyond the N. line of Indian corn, but here the hardier grains mature. The southern produces Indian corn and the winter grains abundantly, and is the great agricultural district of the state. The soils in this portion are deep, chiefly a dark loam, often mixed with gravel and clay, and very fertile. The northern peninsula with some exceptions is rugged and has a poor soil. It is however well timbered with white pine, spruce, hemlock, birch, oak, aspen, maple, ash, and elm. Much of the southern is occupied by oak openings and prairie, with a large portion of forest, in which walnut, sugar maple, oak, hickory, ash, basswood, elm, linden, locust, dogwood, beech, sycamore, cherry, pine, hemlock, spruce, tamarack, cypress, cedar, and chestnut are the prevailing growths. The principal wild animals of Michigan are the black bear, wolf, lynx, wild cat, panther, fox, marten, weasel, skunk, mink, otter, elk, deer, raccoon, squirrel, opossum, marmot, beaver, hare, and rabbit; but these are rapidly disappearing. The lakes and streams afford productive fisheries, among which are those of the far-famed white fish.—Michigan abounds with natural

objects and antiquities interesting to the traveller. Among the former the most noteworthy are the "Pictured Rocks," on the shores of Lake Superior, about 30 m. W. of Sault Ste. Marie. These are sandstone bluffs of various colors, worn by the action of the waters into grotesque forms resembling castles, temples, arches, colonnades, &c., which from a steamer on the lake have the appearance of a gorgeous picture. These rocks extend along the shore for about 12 m., and rise from 200 to 300 feet above the water. Sometimes cascades shoot over the precipice so that a vessel may sail between the descending waters and the natural wall of rock. In the northern peninsula there are the remains of very ancient mines and mining tools, and it is evident that a race well advanced in civilization has occupied the country at some very distant period in the past, and of which the Indians found in possession by the early explorers from Canada could give no account. Foster and Whitney ("Executive Document No. 69," 31st congress, 1st session) give an interesting chapter on this subject.—Michigan is chiefly an agricultural country, but is also engaged to a considerable extent in manufactures, and largely in mining and commerce. In 1850 it contained 84,089 farms, covering 1,929,110 acres of improved and 2,454,780 acres of unimproved lands, valued at \$51,872,446, and the value of implements and machinery thereon was \$2,891,871. In 1854 the amount of land subject to tax was 7,917,322 acres, of which, according to the census of that year, only 2,111,660 acres were under cultivation. The live stock in the state in 1850 consisted of 58,506 horses, 70 asses and mules, 99,876 milch cows, 55,350 working oxen, 119,471 other cattle, 746,435 sheep, and 205,847 swine, in the aggregate valued at \$8,008,734; and the value of animals slaughtered in 1849-'50 was \$1,328,327. In 1854 there were 91,564 horses, 106 asses and mules, 139,260 milch cows, 67,033 working oxen, 141,253 other cattle, 964,333 sheep, and 239,882 swine. The products of animals in the year 1849-'50 were: butter, 7,065,878 lbs.; cheese, 1,011,492; wool, 2,043,283; beeswax and honey, 359,282; and silk cocoons, 108. In 1853 the quantity of butter was 7,924,896, of cheese 779,580, of wool 2,680,747, and of pork (marketed) 11,258,841 lbs. The grain crops in 1849 consisted of 4,925,889 bushels of wheat, 5,641,420 of Indian corn, 105,871 of rye, 2,866,056 of oats, 75,249 of barley, and 472,917 of buckwheat; in 1853, of 7,027,932 bushels of wheat, 7,630,658 of Indian corn, and 2,294,420 of rye, oats, barley, and buckwheat. The production of potatoes in 1850 was 2,361,074 bushels, and in 1853, 2,917,434; hay, 404,934 and 496,041 tons; maple sugar, 2,439,794 and 1,611,462 lbs. The other crops specified in the census of 1850 were: hops, 10,663 lbs.; clover seed 16,989, and other grass seed 9,285 bushels; peas and beans, 74,254 bushels; flax seed, 519 bushels; flax, 7,152 lbs.; molasses, 19,823 galls.; tobacco, 1,245 lbs.; wine, 1,654 galls.; products of mar-

ket gardens \$14,728, and of orchards \$182,650. The total value of agricultural products in 1840 was \$3,207,048, and in 1850, \$17,829,385; and the value of home-made manufactures in 1840 was \$118,955, and in 1850, \$840,947. The average crops per acre in 1849 were: wheat 10, Indian corn 82, oats 26, potatoes 140, and buckwheat 14 bushels.—According to the digest of manufacturing statistics published by congress in 1859, the number of manufacturing, mining, and mechanic establishments in 1850 was 2,323, and the capital invested therein \$6,563,690; the cost of raw material was \$6,136,328; the number of hands employed, 9,844, viz., 8,990 males and 854 females; cost of labor, \$2,716,124; value of products, \$11,169,002. The census of 1850 states the number of establishments at 1,963, and specifies 15 woollen mills (capital \$94,000), 1 pig iron (\$15,000) and 68 cast iron works (\$195,450), 29 distilleries and breweries (\$126,635), and 69 fisheries (\$80,806). The value of manufactures produced in 1810 was \$52,518; in 1820, \$100,460; and in 1840, \$3,898,676. The census of 1854 exhibits the manufacturing statistics thus: flouring mills 245 (24½ steam and 220½ water power), with 618 runs of stones, employing 604 persons and a capital of \$1,828,006, and producing (in 1853-'4) 998,503 barrels of flour valued at \$3,567,978; saw mills 889 (271 steam and 618 water power), capital \$2,442,577, men 4,579, producing \$3,273,086; oil mills 3, producing 2,293 barrels of oil and 10,782 barrels of peppermint oil; breweries 28, producing 36,392 barrels of beer; distilleries 13, producing 260,340 galls. of spirits, 1,215 galls. of wine, and 2,829½ barrels of cider. The fisheries produced 47,303 barrels. The capital invested in mines was \$4,747,950; and their products were as follows: copper ore, 4,987,881 lbs., valued at \$980,081; iron ore, 1,810,000 lbs., valued at \$32,750; coal, 60 tons, valued at \$180.—The foreign commerce of Michigan is chiefly with Canada. Of late years an occasional vessel has been despatched from Detroit direct for Europe, but such occurrences are exceptional. The value of imports and exports for the 10 years from 1850 to 1859 inclusive, ending June 30, was as follows:

| Years. | Imports. | Exports. |
|------------|-----------|-----------|
| 1850 | \$144,102 | \$182,045 |
| 1851 | 182,146 | 191,426 |
| 1852 | 192,240 | 145,152 |
| 1853 | 311,290 | 253,685 |
| 1854 | 304,296 | 424,495 |
| 1855 | 281,379 | 563,091 |
| 1856 | 890,664 | 981,028 |
| 1857 | 1,018,553 | 1,502,606 |
| 1858 | 672,984 | 5,138,707 |
| 1859 | 1,067,389 | 3,624,624 |

The shipping employed in this trade in 1858-'9 amounted to 838,419 tons, viz.: entered, 363,830; cleared, 475,089. The shipping owned in the state, June 30, 1859, amounted to 74,371 tons, of which 33,005 tons were steam; and the shipping built amounted to 2,832 tons. Much of the trade is carried on by railroad *via* Sarnia and Windsor, Canada. No estimate of the value

of the domestic trade is attainable; the census of 1854 states the imports (foreign and domestic) entered for sale at \$13,783,122, but this probably included merchandise in transit. The lumber trade is very important, its staple being white pine, which is produced here in great abundance and of excellent quality. Detroit is the principal port engaged in foreign commerce. Monroe, Port Huron, Saginaw, Grand Haven, St. Joseph's, and New Buffalo are chiefly engaged in the domestic trade. The coasting trade is carried on with great activity, chiefly by steamers, and connects the ports of this state with the principal lake ports of the neighboring states, and steam navigation has already been extended to the copper and iron ports of Lake Superior. The total shipping belonging to Michigan and employed in this trade in 1859 was 78,086 tons; but this shows simply the amount and not the movements of the tonnage, and moreover it does not include the shipping registered in other states. The transit trade is carried on chiefly by the three great railroads, the southern, central, and Milwaukee lines, which stretch across the country in an E. and W. direction, having Toledo, O., Monroe, Detroit, and Port Huron as their initial points on the E., and Chicago and Grand Haven (opposite Milwaukee) on the W. These form links in the great chains of railroads between the upper Mississippi on the one hand and the St. Lawrence and Atlantic seaboard on the other; and over these the vast interchange of the commodities of the opposite sections is chiefly effected. The total length of railroads on Jan. 30, 1859, was 1,081 miles; their respective length and cost are given in the following table:

| Railroads. | Miles. | Cost. |
|--|--------|-------------|
| Detroit and Milwaukee | 189 | \$9,008,860 |
| Detroit, Monroe, and Toledo | 51 | 1,902,821 |
| Chicago, Detroit, and Canada G. T. junction | 57 | 1,140,000 |
| Iron Mountain (N. Michigan) | 17 | 850,000 |
| Michigan Central | 234 | 12,847,258 |
| Michigan Southern & Northern Indiana (with branches) | 484 | 14,743,756 |

A part of this mileage is in other states. There are several lines in course of construction, as those from Port Huron to a junction with the Milwaukee line, from Saginaw City to Lansing and Constantine, from Fort Wayne to Grand Rapids and Mackinaw, from Amboy *via* Lansing to Mackinaw, from Flint to Traverse Bay, &c.; and several in the northern peninsula which will connect with the Wisconsin and Minnesota lines. With these when completed the state will have about 2,500 m. of railroad, and every district will have ample means of communication. The construction of most of these will be aided by congressional land grants. There are several short canals, chiefly harbor improvements, in the state, and others are constructing under the sanction of congress by the topographical engineers. The canal at Sault Ste. Marie, connecting Lakes Superior and Huron, is a most important work,

and though less than a mile in length has been a chief cause of the rapid development of the Lake Superior mining region. The length of post route in this state in 1858 was 7,909 m., of which 880 m. was railroad and 650 m. steam navigation. In Jan. 1860, there were 8 banks in Michigan, whose condition was as follows: Liabilities: capital, \$745,804; circulation, \$147,698; deposits, \$681,748; profits on hand, \$79,287; total, \$1,654,032. Resources: notes, bills of exchange, &c., \$1,487,698; specie, \$41,982; real estate, \$124,357; total, \$1,654,032.—Michigan is governed under the constitution of Aug. 5, 1850. Every white male citizen, and every male Indian not a member of a tribe, 21 years of age, and having resided in the state 3 months and in the district 10 days next preceding an election, is entitled to vote and hold office. The general election is held on the Tuesday after the 1st Monday in November biennially. The legislature (pay of members \$3 a day for 40 days) consists of a senate of 32 members and a house of representatives of 66 members, all elected from districts for 2 years. Sessions begin on the 1st Wednesday in January (odd years) every 2d year. The governor (salary \$1,000) is elected for 2 years by the people at large. He must be 30 years of age, and have been a citizen of the United States for 5 years and of the state for 2 years next preceding. The lieutenant-governor is elected for the same term, and must have the same qualifications. He is *ex officio* president of the senate, during whose sessions he receives \$3 per day. The administrative officers are also elected by the people for 2 years, and have pay as follows: secretary of state, \$800 and fees; deputy secretary of state, \$700; auditor-general, \$1,000; state treasurer, \$1,000; attorney-general, \$800; superintendent of public instruction, \$1,000; commissioner of land office, \$800. The judiciary consists of a supreme court, circuit courts, county probate courts, and justices' courts. Municipal courts are also established in Detroit and other cities. The supreme court consists of a chief and 3 associate justices (salary \$2,500), with a reporter. The circuit court has a judge (salary \$1,500) in each of the 10 circuits into which the lower peninsula is divided. The upper peninsula has a district court, the judge of which receives \$1,000 per annum. All the judges are elected by the people. The public revenue is derived chiefly from taxes on incorporated companies, sales of school and university lands, 5 per cent. of the moneys received for U. S. lands sold within the state, &c. For the year ending Nov. 30, 1858, the total receipts were \$865,720.85; and the total means of the treasury, including a balance of \$158,642.70, amounted to \$1,024,363.05. The disbursements for the same year amounted to \$848,015.85. Nearly one half of the receipts and expenditures are on account of special funds administered by the state. The public debt amounted to \$2,337,029.67, upon which the interest paid the previous year was \$140,257.78. The total value of taxable prop-

erty in the state in 1850 was \$30,877,228, and in 1857 \$120,362,474. The principal institutions supported wholly or in part by the state are the asylum for the insane at Flint, the asylum for the deaf and dumb and the blind at Kalamazoo, the state prison at Jackson, the house of correction for juvenile offenders at Lansing, the state agricultural college, and the state normal school. The whole number of paupers supported in whole or part within the year ending June 1, 1850, was 1,190, at a cost of \$27,556; and the number remaining on the lists was 429. The whole number of criminals convicted in 1849-'50 was 659, and there remained in prison, June 1, 1850, 241.—The school system of Michigan is based upon that of Prussia, the most complete in the world. Ample provision is made for primary schools, and by the grouping of several of these union schools are formed, designed as preparatory to the state university, which is a nearly free institution. On Sept. 25, 1858, there were in the state 8,946 organized school districts, with 225,592 children between the ages of 4 and 18; number attending school, 173,594; average length of schools, 6 months; number of teachers, 7,281 (2,326 males and 4,905 females); paid for teachers' wages, \$442,227. The amount raised by district tax for the support of common schools was \$316,580.71; by a general mill tax, \$116,362.04; by rate bill, \$118,099.89. There were 168,977 volumes in the township libraries, which by act of the legislature in 1859 were authorized to be converted into school district libraries. The principal collegiate and professional schools in the state are the university of Michigan, Ann Arbor; St. Philip's college, Detroit; the medical and law departments of the university; Albion female college and Wesleyan seminary, at Albion; Kalamazoo college at Kalamazoo; and the state normal school at Ypsilanti. The school fund in 1855 amounted to \$1,384,288, and the university fund to \$452,423. The number of churches in the state in 1850 was 399, and the value of church property was estimated at \$723,600. Of the churches, 119 belonged to the Methodists, 72 to the Presbyterians, 66 to the Baptists, 44 to the Roman Catholics, 29 to the Congregationalists, 25 to the Episcopalians, 12 to the Lutherans, 10 to the Dutch Reformed, and 7 each to the Friends and Universalists. In the same year there were in the state 417 libraries, other than private, having 107,948 volumes. Of these, 280 (65,116 vols.) were public, 119 (31,427 vols.) school, 15 (3,500) Sunday school, and 8 (7,900) college libraries. The public press included 58 periodical publications, circulating annually an aggregate of 3,247,736 copies, viz.: 8 daily (1,252,000 copies), 2 tri-weekly (52,000), 47 weekly (1,685,786), 3 semi-monthly (184,400), 3 monthly (128,600); and 18 were literary (456,500), 40 political (2,582,886), 3 religious (184,400), and 2 scientific (74,000).—The word Michigan appears to be derived from the Chippewa language, *mitichaw*, great, and *sagiegan*, lake, a name for-

merly applied to both Huron and Michigan, but now restricted to the western lake. The discovery and early settlement of Michigan is due to the French missionaries and fur traders. The site of Detroit was probably visited as early as 1610. Soon after the middle of the 17th century trading posts were established at Sault Ste. Marie, Michilimackinac (old fort), and Green bay. In 1701 an expedition under Antoine de la Motte Cadillac founded Detroit. From this period until the erection of the country into a territory of the United States, there is little in the history of Michigan which demands notice in this place. It made slow progress, and came under the dominion of Great Britain with other French possessions in 1763. On the expulsion of the French the conspiracy headed by the Indian chief Pontiac, and designed for the extermination of the whites, broke out and involved the settlements in bloodshed. The garrison of Michilimackinac was butchered, and Detroit underwent a long siege. On the treaty of peace which closed the revolutionary war, Michigan was not at once surrendered, and the Americans did not take possession of Detroit until 1796. From this time it was included in the government of the territory northwest of the Ohio, and hence has always been amenable to the ordinance of 1787. In 1802, when Ohio was admitted as a state, Michigan was annexed to the territory of Indiana. In 1805 the territory of Michigan was constituted, Gen. William Hull being its first governor. During the war of 1812 it was exposed to great suffering. Detroit was taken by the British in Aug. 1812, under circumstances which led to Gen. Hull, the American commander, being sentenced to death by a court martial; the sentence however was not executed, and facts which have recently come to light relieve his character from the aspersions cast upon it. Michilimackinac was also captured, and at Frenchtown, in Jan. 1813, a number of American prisoners were massacred by the savages. The British were soon afterward driven out of the territory by Gen. Harrison; and in Oct. 1814, a truce was concluded with the Indians. The first land surveys entered upon were commenced in 1816, and in 1818 the lands were brought into market for public sale. From this period the prosperity of Michigan properly dates. In 1818 all the territory lying north of the present states of Illinois and Indiana was annexed to Michigan. In 1819 the territory was authorized by act of congress to send a delegate to that body, and the right of suffrage in this case extended to all taxable citizens. In 1819, 1821, and 1836 the Indians made important territorial cessions, and by this time all the lower peninsula and a part of the upper were freed from Indian title. Up to 1828 the legislative power was intrusted to the governor and judges; but in that year congress passed an act transferring it to a council, consisting of 9 persons selected by the president from 18 chosen by the citizens, and the judicial term was lim-

ited to 4 years. In 1825 the council was increased to 13 members selected as before, but two years later the law was so altered that the electors could choose their councillors without the further intervention of the president or congress. In May, 1835, a convention at Detroit formed a constitution by which Michigan claimed a strip of territory also claimed by Ohio. For a time a conflict seemed inevitable, but in June, 1836, Congress passed an act admitting Michigan into the Union upon condition that she relinquished her claim to the disputed territory, in place of which the region, known as "the upper peninsula," was given to her. These conditions were rejected by one convention, but accepted by another in Dec., 1836, and in Jan., 1837, Michigan was admitted into the Union.

MICHIGAN, LAKE, one of the 5 great lakes of the northern United States, and the only one of them which is entirely included in these states. It lies in a N. and S. direction, extending from the northern part of Illinois 320 m. to Mackinaw, where it communicates with Lake Huron by a strait 4 m. wide in its narrowest part. The lake is bounded on the E. by the lower peninsula of Michigan. The upper peninsula bounds it on the N. W. In this portion is Green bay, which extends S. into Wisconsin; this state and Illinois complete the western boundary of the lake. The following are its dimensions as given by Dr. Douglass Houghton: mean length, 320 m.; mean breadth, 70 m.; mean depth, 1,000 feet; elevation above the sea level, 578 feet; area, 22,400 sq. m., exceeding the area of Lake Huron by 2,000 sq. m. The country around Lake Michigan is for the most part low and sandy; on the E. side particularly the sands thrown up by the waves are blown inland and form hills, which sometimes are 150 feet high. The rocks are the limestones and sandstones of the sub-carboniferous groups, lying in horizontal strata, and never rising into bold cliffs. On the Michigan side they belong chiefly to the Portage and Chemung groups, and on the Illinois side to the Helderberg limestone. Along the southern shores are post-tertiary beds of clay and sand lying a few feet above the level of the lake, and containing fresh water shells like those living in its waters. This fact and the low watershed that separates the lake from the valley of the Illinois river, together with the great capacity of this valley, which appears as if worn by a mighty river, render it probable that the waters of Lake Michigan at some period found their way by the valley of the Mississippi into the gulf of Mexico. The lake at present is believed to be moving westward, gradually encroaching on the shores of Wisconsin and leaving those of Michigan. From observations made at Chicago, Ill., Lieut. Col. James D. Graham, of the topographical engineers, U. S. army, has shown the existence of a lunar tidal wave in Lake Michigan. He published this fact in his report to the war department, Nov. 15, 1858, and also in a communication to the Chicago historical society, on the

80th of the same month. The result of still later observations was given in a memoir read before the American association for the advancement of science at the Newport meeting, Aug. 1, 1860. The mean of 840 observations shows a difference of elevation of the lake surface between high and low water of 153 thousandths of a foot; and the mean of 24 semi-diurnal spring tides (*i. e.*, one day before and two days after new or full moon) gives a difference of elevation of 245 thousandths of a foot, or a little over 8 inches. High water occurs half an hour after the meridian passage, or southing of the moon.— Few harbors and bays are met with around the lake, and the only islands it contains are at its N. E. extremity. It is not therefore a very safe lake to navigate, especially as it is subject to severe storms at different seasons of the year; but until the railroads were completed across the state of Michigan, it was much navigated by fine passenger steamers, whose route extended from Buffalo to Chicago; and many freighting vessels and steamers are still employed during the season of navigation upon the same and many shorter routes. The straits of Mackinaw, which longest retain the ice, are usually open between May 1 and Dec. 1. The fish of the lake are like those found in Lake Huron, and the fisheries are for the most part concentrated about Mackinaw. The best harbors are at Little Traverse bay, and at Grand Haven at the mouth of Grand river on the E. shore of the lake. Chicago, at the head of the lake, has but an indifferent harbor, and the same may be said of those of Milwaukee and Sheboygan on the W. side. There are 23 lighthouses on the shores, beside 4 beacons.

MICHIGAN, UNIVERSITY of, an institution of learning at Ann Arbor, Washtenaw co., Mich., about 40 m. W. from Detroit. It owes its foundation to a grant of lands to the territory of Michigan made by congress in 1826 to provide for education, and consisting, beside 1,000,000 acres for primary schools, of two townships containing 72 entire sections, which, on the admission of Michigan into the Union in 1836, were conveyed to the state solely for the use and support of the university. The plan of the university originated with the Hon. J. E. Crary and the Hon. John D. Pierce. It was at first grafted upon the college of Detroit, and the present institution was established by an act of the legislature in 1837. No portion of the 72 sections of land had been sold, except to the amount of \$5,000 by the trustees of the old university; and as no funds existed with which to put the institution in operation, \$100,000 was borrowed in 1838, for which the state gave its bonds payable in 20 years. This was lent again by the state to the university, with the agreement that the principal and interest were to be paid out of the income of the university lands. About \$122,000 has been paid in interest and discount on this loan, and it still remains a debt from the university to the state; but the legislature has remitted the interest until further

legislation. In 1842 the faculty consisted of 4 professors. In 1843 there were 50 students; and the first class, numbering 11, was graduated in 1845. The medical department was organized with 80 students in 1850, and the law department with 90 students in 1859. Before 1850 the institution had never had a president or a distinctive officer. A new board of regents chosen by the people, in accordance with a change in the constitution effected in 1850, elected the Rev. Henry P. Tappan, D. D., of New York, with the title of chancellor. One of his earliest achievements at the university of Michigan was the establishment of a first class astronomical observatory, the subject of which was first introduced in his inaugural address in 1852. The funds arose from a subscription by the citizens of Detroit, and in 1854 Dr. Brunnow was invited from Berlin to take the direction of it. In 1856 a chemical laboratory was erected. In the same year an important addition was made to the natural history collection through the instrumentality of Prof. Trowbridge of the university, formerly of the corps of engineers of the army, consisting of 800 specimens in zoology, duplicates of collections made by him on the Pacific coast for the Smithsonian institution. At the same period Prof. Friesz brought from Europe valuable additions in books, maps, engravings, photographs, and copies in plaster and terra cotta of some of the most beautiful antiques of the great museum at Naples, of the Vatican, and the Louvre; and Prof. Bradish was subsequently sent abroad by a friend of the university to make an extensive collection of similar copies. The medical and general scientific collections are valuable. There are now (1860) 28 professors and instructors and over 600 students, 120 of whom are law students, and the clear income of the institution is about \$40,000 per annum. The only charges to students are an admission fee of \$10 and an annual payment of \$5.

MICHIGAN CITY, a village of Laporte co., Ind., on the S. shore of Lake Michigan, at the mouth of Trail creek, 13½ m. N. W. from Laporte, and 56 m. S. E. from Chicago; pop. in 1850, 2,353; in 1860 estimated at 3,500. It is the principal lake port in the state, and has excellent facilities for trade. The Michigan central, and the Louisville, New Albany, and Chicago railroads intersect at this point. It contains 7 churches (5 Protestant and 2 Roman Catholic), a number of manufactories and warehouses, several benevolent institutions, and a weekly newspaper office.

MICHILIMACKINAC, or **MACKINAC**, an E. co. of the upper peninsula of Michigan, bordering on Lake Michigan and the straits of Mackinaw; area, 1,800 sq. m.; pop. in 1850, 3,598. The surface is uneven and is well wooded. Timber is the principal article of export. In 1850 there were 10 churches, and 848 pupils attending public schools. Capital, Mackinac.

MICHILIMACKINAC, **MACKINAC**, or **MACKINAW**, the capital of Michilimackinac co.,

Mich., on an island of the same name in Lake Huron, 320 m. N. N. W. from Detroit; pop. about 1,500. It has a safe and deep harbor, and is a fashionable summer resort. Fort Mackinac, a U. S. military post, is on a rocky eminence about 150 feet high commanding the village. It contains the county buildings, several churches, 2 saw mills, 8 stores, and 4 hotels. It exports considerable quantities of fish.

MICHOCAN, MECHOACAN, or VALLADOLID, a state of the Mexican confederation, bounded S. W. by the Pacific, and on other sides by Colima, Jalisco, Guanajuato, Queretaro, and Mexico, between lat. 17° 55' and 20° 37' N., and long. 100° and 104° W.; area, 22,220 sq. m.; pop. 491,679. The state is divided into 4 departments and 62 municipalities. The N. and E. consists of a table land 5,000 to 6,000 feet above the level of the sea, from which rise several snow-covered peaks. Toward the W. the country descends by terraces to the Pacific, along which stretches a tract of low land extending several miles inland. There are numerous small streams, but the Bolsas, which forms the boundary toward Mexico on the S. E., and the Lerma, with their respective tributaries, are the most considerable rivers. There are several lakes in Michoacan. A great deal of the soil is fertile and capable of producing all the ordinary fruits of the temperate and tropical regions. The sides of the mountains are covered with valuable timber. There are mines of gold, silver, and lead, which were once wrought extensively. As there are no seaports on the coast, the productions of the state are carried inland to Mexico and other places. Morelia, or Valladolid, is the capital, and the other principal towns are Pácuaro and Zitacuaro. The climate is remarkably healthful. Along with Jalisco and Colima, this state formed the ancient kingdom of Michoacan.

MICKIEWICZ, ADAM, a Polish poet, born in Novogrodek, Lithuania, in 1798, died in Constantinople, Nov. 27, 1855. He was the son of a poor advocate of noble birth, and studied at his native place, at Minsk, and at the university of Wilna, where he became intimately connected with the historian Lelewel, and with the patriot Zan. Having for some time studied physics and chemistry under Sniadecki, Mickiewicz finally devoted himself almost exclusively to literature and poetry, and received an appointment as professor of literature at Kovno. In 1822 he published in Wilna two small volumes of poetry, which contained, among others, some of the finest ballads in the Polish language, a historical epic, "Grażyna," the scene of which is his native place, and the principal character a Lithuanian heroine, and under the title of *Drady* a romantic autobiographical drama, in which the author described his unhappy love for Maria, the sister of a former fellow student. This collection, which was afterward augmented, and of which "Grażyna" is undoubtedly the most valuable part, at once raised Mickiewicz to the highest rank in Polish poetry. He was idolized by the revolutionary youth of Poland, par-

ticularly after he was tried for participation in the secret associations of Zan, imprisoned in the Basilian convent at Wilna, and finally condemned, in 1824, to perpetual banishment from his native country. He was removed to St. Petersburg, where he became familiar with the most distinguished Russian liberals, and subsequently to Odessa, whence he was allowed to make a tour through the Crimea. This he partly described in his "Sonnets," which were soon after followed by his second epic, "Wallenrod," published in 1828 at St. Petersburg, whither he had received permission to return. This poem, in many respects one of his greatest productions, the theme of which is the struggles of the Lithuanians in the 14th century against their oppressors, the Teutonic knights, though breathing throughout the spirit of the most unbridled hatred of foreign dominion, was favorably received in Russia, being also translated into the Russian language, and the author was even allowed to enter upon a tour through Germany and France to Italy for the restoration of his health. At Rome, where he made the acquaintance of J. Fenimore Cooper, he received the news of the outbreak of Nov. 29, 1830, in Poland. Mickiewicz, however, did not reach the confines of his native country until the great struggle had ended in a terrible catastrophe, and he never more entered Poland; but as an exile in foreign lands, he could now give full vent to the domineering passion which animated his glowing poetry. He went to Dresden, and there wrote the 2d part of *Drady* (Paris, 1832), in which he described his imprisonment and the cruelties perpetrated by Russian tyranny on Poland, in verses full of the wildest romantic eccentricity, and bristling with horrors of every description. A little less extravagant production, but one also of less merit, was his *Księgi narodu polskiego i pielgrzymstwa polskiego* ("Books of the Polish Nation and the Polish Pilgrimage," Paris, 1832), which was followed by another of his great poetical works, *Pan Tadeusz* ("Sir Thaddeus," Paris, 1834), a picture of Lithuanian life and society in 1812 at the approach of Napoleon's invasion, which is the chastest, and, according to the judgment of many, the noblest of his writings. In the same year, having now established himself at Paris, he married Celina Szymanowska, a Polish lady, who had been an early acquaintance. In 1839 he accepted a professorship of classical literature at Lausanne in Switzerland, but in the following year he returned to Paris to fill the chair of Slavic literature recently established at the collège de France. His spiritual life had long before undergone a striking metamorphosis, and he was already known as a zealous if not fantastic advocate of Roman Catholicism, from which he hoped for a regeneration of his country, as well as of Panslavic tendencies, which were not shared by all of his fellow exiles. His "Lectures on Slavic Literature," published in both French and German, gradually developed still more surprising phases. The inspiring genius of these

revelations was a fanatical Polish priest, Towianski, who had mesmerized Mme. Mickiewicz in a dangerous illness in 1841, from which she recovered, and who, pretending to be enlightened by celestial visions, was followed by Mickiewicz as the Messiah of a new religion, in which the memory of Napoleon received almost divine honors. The reputation of Mickiewicz had greatly decreased with these developments, which caused the expulsion of Towianski from Paris, and the interruption of the lectures by the government, when the revolution of Feb. 1848, inspired the poet to new activity. In order to gain over Pius IX. to his schemes of national regeneration, he started for Italy, and at Florence received a flattering ovation. In 1851 he was appointed by Louis Napoleon, then president, sub-librarian of the library of the arsenal at Paris; and on the outbreak of the war against Russia, he headed a Polish deputation to the French emperor, calling upon him to turn the great movement in favor of their oppressed country. Soon after he was sent on a secret mission to Constantinople, where he ended his career. His wife having died before him, a subscription was raised for the benefit of his children in France and England. His remains were removed to the cemetery of Montmartre, Paris, where they rest between those of his distinguished countrymen Niemcewicz and Kniaziewicz. His works have passed through numerous editions, and have been partly made known to other nations in various more or less successful translations.

MICKLE, WILLIAM JULIUS, a Scottish poet, born in Langholm, Dumfriesshire, in 1784, died in Wheatley, Oxfordshire, Oct. 25, 1788. After pursuing various occupations, he became in 1765 corrector of the Clarendon press at Oxford, and from time to time he produced small poems which gained him some notice. In 1771 he published his translation of the 1st book of the "Lusiad," and completed the work in 1775, since which time it has passed through many editions. "Cumnor Hall," the best perhaps of all his poems, suggested "Kenilworth" to Scott.

MICROMETER (Gr. *μικρος*, small, and *μετρον*, measure), a contrivance adapted to the telescope and microscope for measuring minute spaces, angular or linear, in the field of view. It is not a little remarkable that the simplest micrometer now in common use (Troughton's filar) does not greatly differ in its most essential principle from the network of silver wires constructed about 1622 by the marquis of Malvaria, and is almost identical in its leading features with the instrument devised by Gascoigne in England about 1640, as improved soon after by his countryman Dr. Hooke. This instrument, called variously the parallel wire, the wire, the spider line, and the filar micrometer, consists essentially of a pair of parallel fibres—a spider's web usually—with a contrivance for separating or bringing them into coincidence, together with an arrangement for denoting the distance between them at any degree of separation. This motion is given by very fine-threaded

screws working against frames across which the fibres, or wires, as they are called, are stretched. Placed in the focus of the instrument, it affords a means of subdividing minutely the field of view, and of accurately measuring the interspaces; so that the apparent diameter of a body, a planet for example, or the apparent distance apart of two stars or other bodies lying in the same field of view, can be determined. The number of turns and parts of a turn of one of the screws necessary to move the wires across the interval to be measured, expresses the measurement. A motion given to this apparatus in a plane perpendicular to the axis of the instrument constitutes it a position micrometer, the use of which is to determine the difference of direction between a fixed line, a parallel of declination for example, and a line joining two points in the same field. There are many modifications of the filar micrometer, in which the wires are fixed in position, and in one of which the interspaces are widened or narrowed optically by changing the magnifying power of the instrument. This is done by varying either the distance of the two parts of the eye piece or the focal length of the object glass by means of another object glass interposed. Instead of using the web of the spider, lines are sometimes cut on glass with fluoric acid. One great drawback in the use of the filar micrometer is its incapacity to measure any except very minute distances. Mr. Alvan Clark, of Boston, has invented a modification of the instrument, which enables him to measure any distance up to one degree. The best and most expensive micrometers are constructed on the principle of the duplication of the image according to optical laws. This is accomplished in the heliometer by dividing the object glass of the telescope along a plane passing through the optical axis of the instrument; each half will form a perfect image, and the two images are separated or brought into coincidence by a sliding motion of the prisms in their common plane and in the direction of their cut edges. In another variety of the instrument the double images are separated optically. Two prisms, producing independent images, are fixed together and arranged to move between the object glass and its principal focus, thus varying at pleasure the angle which the images form. The property which some crystals, as Iceland spar, possess, of causing bodies viewed through them to appear double, is also applied to the construction of micrometers. Lewis M. Rutherford, Esq., has in use at his private observatory in New York an ingenious and convenient micrometer in which a double image is produced by the use of two parallel plates of glass placed edge to edge in the eye piece of the telescope. The angle of the images is varied from zero by giving to one plate a revolving motion around an axis contained in the common plane of the two, and perpendicular to their line of section, while the other plate remains fixed.

MICRONESIA AND MELANESIA (Gr. *μικρος*, small, *μελας*, black, and *νησος*, island), terms derived from the size and complexion of the inhabitants, and applied by some geographers to arbitrary divisions of the islands of the Pacific ocean. These divisions are both comprehended in the better defined, more convenient, and better understood terms of Australasia and Polynesia. Micronesia and Melanesia occupy the western portion of the Pacific. The former extends from the westernmost island of the Sandwich group to near Japan and the Philippines, and reaches S. of the equator, comprehending the Ladrone islands, the Carolinas, and the Pellew islands. Melanesia embraces the Feejee islands, the New Hebrides, Solomon's islands, New Caledonia, New Britain, New Ireland, and New Guinea.

MICROSCOPE (Gr. *μικρος*, small, and *σκοπεω*, to see), an optical instrument used for the examination of minute objects. Microscopes are of two kinds, simple and compound. With the former, the object is viewed directly, either by means of a single lens or a set of lenses employed in the same manner as a single lens. With the latter, an enlarged image of the object is formed, by a single lens or a set of lenses, termed the object glass or objective; this image is viewed and further amplified by means of an eye piece or "ocular." Each form is valuable in its place, but as a general instrument of research the compound form, with all the modern improvements, is greatly superior. The invention of the simple microscope is not claimed by any one, but that of the compound has been warmly disputed; it is claimed by the Italians and the Dutch. The compound microscope of the present day, however, is a very different instrument from the disputed invention, and it is to this last and best form that we propose to devote the most of our attention.—The earliest magnifying lens known, if indeed it was used for this purpose, is the rude one found by Mr. Layard in the palace of Nimroud; it was made of rock crystal, and was far from perfect. Seneca (*Nat. Quæst.*, lib. i. cap. vi.) alludes to the magnifying power of a glass globe filled with water; he ascribes the effect to the water, and appears to refer to objects immersed in the water; this was about the middle of the first century. "Burning spheres," as they are termed by Aristophanes, were sold in the shops of Athens in the days of that comic author. There is no evidence that lenses at this early date were employed for magnifying, at least further than for reading glasses. It is not until the 17th century that we find powerful magnifiers of glass actually employed for scientific investigation. The names of Malpighi, Lieberkuhn, Hooke, Leeuwenhoek, Swammerdam, Lyonnnet, and Ellis are closely connected with the history of the simple microscope; and the important discoveries made by them sufficiently attest the value of even this form of the instrument. Most of the magnifiers employed by the early observers were minute single lenses of

glass; often small spheres formed by melting threads of glass in the flame of a spirit lamp. The form usually given to the small single lenses of high power is plano-convex, the plane side toward the object; when carefully made, having a focal length of from $\frac{1}{16}$ to $\frac{1}{32}$ of an inch, and well set in shallow blackened cells, with the proper aperture, they perform on ordinary objects tolerably well; much better than the minute glass spheres, as the latter are difficult to obtain free from bubbles. The writer has succeeded better by melting a fragment of plate glass in a small hole in a German silver cup, by means of the blowpipe, and has formed lenses in this way, ready mounted for use, quite equal to those ground and polished by hand. The German silver is blackened by the heat. In order to diminish the spherical aberration in the high magnifier of a single refracting substance, Sir David Brewster suggested the employment of gems; and Mr. Pritchard of London, under the patronage of Dr. Goring, succeeded in grinding lenses of garnet, sapphire, and diamond, all of which proved superior to glass lenses of equivalent focus. The diamond lenses upon the whole were inferior to the sapphire; the latter, though not as highly refractive, were free from the veins which rendered several of the diamond lenses useless, though still affected, in common with the diamond, by double refraction. The garnet lenses are free from this latter defect, and when very minute are much superior to glass; the color is not objectionable when the lenses are very small. All the magnifiers composed of single lenses, glass or gems, are surpassed by the doublets and triplets. The invention of the doublet in its best form is due to Dr. Wollaston; it appears, however, to have been a chance discovery. It consists of two plano-convex lenses, having their plane sides toward the object; the posterior lens (that nearest the eye) is three times the focal length of the anterior, and the distance between them is twice the focal length of the shorter. It is evident that the front lens of the doublet must be approached much nearer to the object than if it had been used alone, and the amplification is also less than that of the front lens alone; hence the working distance is much less than that of an equivalent single lens, and not greater, as erroneously stated by some authors. The great and surpassing advantage of the doublet is the enlarged angular aperture, and diminution of spherical aberration. By "angle of aperture" is meant the angular breadth of the cone of rays proceeding from the object, and, after impinging upon the lens or set of lenses, refracted through. Evidently, with a single lens, having an aperture equal to its focal length, the angle will be about 55° ; in other words, the lines drawn in the same plane from a point to the margin of the lens, this point being in the axis of the lens, and at a distance from its convex surface equal to the diameter of the lens, will be 55° ; no single lens, however, will admit any thing like this aperture. Now in the

doublet the front lens is approximated much closer to the object than it possibly could be if employed alone, and hence it admits a wider angle; the reduction of magnifying power, at the same time, diminishes spherical aberration, which is still further reduced by the peculiar relations of the curvatures. The doublet thus becomes a very superior instrument, and, when well made and carefully used, surpasses all but the most improved forms of the compound instrument. Doublets of gems are far superior to those of glass. Many years since the writer made several garnet doublets of $\frac{1}{8}$ to $\frac{1}{16}$ of an inch focal length, which in performance on test objects quite equalled the best French achromatics of the day. Triplets are superior to the doublets; and for a simple microscope the achromatic triplets now furnished by the French and German opticians, as objectives for the compound microscope, will be found very effective. Essentially, the English and American achromatic objectives are triplets, but the peculiar mounting of these instruments prevents their use as simple microscopes. So great has been the improvement, that the best modern objectives will transmit angular pencils of 170° to 178° . We may notice here the so called "Coddington lens," or grooved sphere. It is an invention of Sir David Brewster, and when properly made is almost free from spherical aberration, and the chromatic aberration is almost insensible. "It consists of a spherical lens, or sphere with a deep concave groove cut round it, so as to cut off the marginal pencils, and thus give a wider field and more perfect image." The lenses usually sold under this name are simply cylinders of glass having spherical ends, and of course have none of the advantages of large field and freedom from spherical aberration proposed by Dr. Brewster. When the curvatures of this cylindrical lens are unequal, and such that, the most convex being turned toward the eye, an object placed on the other convex surface is in the proper focus of the lens, it is called a "Stanhope lens;" its use is limited to such objects as can be directly applied to the surface. When of considerable power it may be advantageously employed in searching for *diatomacea*; the drop of water supposed to contain them may be examined by applying it to the least convex surface. All the simple microscopes, and especially the higher powers, require some kind of a stand or carrier. The lower powers and single lenses are usually attached to the end of a jointed rod, which can be moved up and down a stem inserted into a solid base. The most convenient mounting for a 1-inch or $\frac{1}{2}$ -inch lens for the purpose of preliminary examinations, or botanical dissections, is that of Messrs. Powell and Leland of London, and is employed by them as the mounting of the small condenser for their compound instrument. The movements are complete, and one can place the lens, whatever may be the position of the object, in such a relation to it as will insure the best view. For the higher powers, $\frac{1}{2}$ to $\frac{1}{16}$ of an inch, a steady

well made stand will be required, and some means of adjusting the focus delicately, either by rack-work or screw. Various forms have been devised by different opticians; perhaps, upon the whole, that known as the "Raspail" is most simple, and at the same time of great excellence. It consists of a brass pillar, up and down which a large circular stage is moved by rack-work; a large mirror, one side plane, the other concave, swings freely below, and serves to direct the light upon the object; at the top of the brass pillar is placed the lens holder, movable forward by means of a screw, and laterally by swinging round a pin inserted in the top of the pillar; into the opening of the stage is fitted a glass plate, or it may be made to hold dissecting troughs with glass bottoms. It is often convenient, or absolutely necessary, for the examination and dissection of opaque objects, to have the lens inserted in a silver cup, or Lieberkuhn, which, receiving the light from the mirror below, reflects it back, condensed, upon the object. These Lieberkuhns are usually made of silver. The very simple microscope employed by Ellis in his researches on corallines, and in which all the adjustments were effected by sliding by the hand, was fitted with these silver cups. Although the Lieberkuhn is very commonly applied to the low power achromatic objectives, it is now seldom to be obtained with any form of simple instrument, unless by special order; it will be found of the greatest service in minute dissection. In using lenses of moderate foci, $\frac{1}{2}$ to $\frac{1}{4}$ inch, the most extended distinct field is obtained when the convex side is presented to the object; but the sharpest vision of a minute point or small object, in the centre of the field, is when the flat side is presented to the object. In estimating the magnifying power of single lenses, an arbitrary standard of the nearest distance at which the healthy unassisted eye can view distinctly minute objects is assumed; this distance has been placed at from 5 to 10 inches. The latter is the standard adopted by most opticians and authors; Sir David Brewster alone adopts 5 inches. The magnifying power is usually expressed lineally, or as "so many diameters." Thus, when the magnifying power is stated to be 40, it is meant that the diameter is increased 40 times, but of course the area would be increased 1,600 times. The following table exhibits the linear and superficial magnifying power, adopting the standard of 10 inches:

| Focal lengths in inches. | Linear magnifying power. | Superficial magnifying power. |
|--------------------------|--------------------------|-------------------------------|
| 9 | 5 | 25 |
| $1\frac{1}{2}$ | 6.6 | 43.5 |
| 1 | 10 | 100 |
| $\frac{3}{4}$ | 13.3 | 177.8 |
| $\frac{1}{2}$ | 20 | 400 |
| $\frac{3}{8}$ | 40 | 1,600 |
| $\frac{1}{4}$ | 80 | 6,400 |
| $\frac{3}{16}$ | 100 | 10,000 |
| $\frac{1}{10}$ | 200 | 40,000 |

As it is difficult to measure exactly the solar focal length of small lenses, a sufficient approximation may be had by the method proposed by Mr. Ross, which answers admirably for doublets

and triplets. It consists in "viewing the image of some distant object formed by the lens in question, through another lens of one inch solar focal length, keeping both eyes open, and comparing the image presented through the two lenses with that of the naked eye. The proportion between the two images so seen will be the focal length required. The panes of glass in a window, or courses of bricks in a wall, are convenient objects for this purpose." The comparative focal lengths of two lenses, or sets of lenses, may be determined by holding them at the same distance from the eye and estimating the sizes of the images formed by each of the same object; thus, if one lens forms the image half the size of the other, lineal measure, its focal length is half that of the other. The same method applies to eye pieces.—We pass now to the compound microscope, and shall dwell only upon the construction and use of the instrument in its most approved form. For a history of the earlier forms, the reader may consult the elaborate works of Quekett and Harting, and the older works of Adams and Baker. Essentially it consists of two parts, the object glass and the eye piece. The former is now made by a combination, usually, of 8 sets of achromatic doublets, arranged to give the greatest freedom from spherical and chromatic aberration; the latter, of two plano-convex lenses, with the plane sides to the eye, the lens nearest the object, or "field lens," being almost exactly double the focal length of the eye lens, and the distance between them a little more than the focal length of the field lens; the ratio is varied somewhat by different makers. The eye piece thus formed is termed a "negative eye piece," or the "Huyghenian." The eye piece of Kellner is a decided improvement; it is termed "orthoscopic," and the eye lens is achromatic or nearly so; these eye pieces are supplied by the Messrs. Grunow of New Haven, Conn., with their best instruments; the field of view is large, free from distortion, and well defined throughout the whole extent. The orthoscopic eye piece supplied by Mr. Charles A. Spencer, and more recently as improved by R. B. Tolles, of Canastota, has both eye and field lens achromatic, and is exceedingly perfect; it is, however, more expensive than the Kellner eye piece. Mr. Tolles has also introduced very recently a solid, orthoscopic, negative eye piece, of remarkable clearness and definition throughout, especially fitted for micrometric use, the engraved scale being cemented in the body of the solid eye piece, and perfectly protected from all dust or interference with definition, so noticeable in the use of the eye-piece micrometer in the ordinary way. So far as we are aware, the English opticians have not yet adopted the improved eye pieces, but have devoted all their skill to the perfection of the objectives and the stands. The "Jurors' Report" of the exhibition of 1851 mentions a solid eye piece, a positive triple achromatic, very thick; but it appears not to have come into general use. Mr. Tolles has also

introduced what is termed an amplifier, being an achromatic concave of peculiar construction, which is introduced within the body of the microscope by means of an adapter. The corrections of the objective are not in the least disturbed by this arrangement, but the power is doubled. A low eye piece thus gives as much amplification as a higher one, but with the very great advantage of almost perfect flatness of field.—The object glasses, or "objectives" as they are now very commonly termed, derive their denominations, 1 inch, $\frac{1}{2}$ inch, $\frac{1}{4}$ inch, &c., from the fact that the combined sets of lenses give a magnifying power the same as a single lens of the same name. Thus, a $\frac{1}{4}$ object glass should give the same amplification as though a single lens of $\frac{1}{4}$ of an inch was used in its place. This term does not refer at all to the working distance, for, as is the case with doublets, the working distance with all powers higher than the $\frac{3}{4}$ inch is considerably less than that of the equivalent single lens; it will be apparent that for any given focus the working distance will, in general, be diminished by an increased angle of aperture; a $\frac{1}{4}$ of 90° will have in this respect a very great advantage over a $\frac{1}{4}$ of 140° . As regards the merits of the large angle objectives, there are various opinions. Dr. Carpenter is decided in his condemnation, considering that depth of penetration cannot be had at the same time with enlarged angle. The skill of the first opticians, Spencer, Tolles, and Grunow in America, Ross, Powell and Leland, and Smith, Beck, and Beck in England, have proved the contrary. Nor is Sir David Brewster's assertion true of large angle objectives, that they give a distorted view. The definition, clearness, and perfectness of vision with Powell and Leland's $\frac{1}{4}$, having an angle of 176° , when employed with a low eye piece so as to give the same amplification as a $\frac{1}{4}$ with a higher, is greatly superior to that of the $\frac{1}{4}$. The chief advantage of the small angle has been considered to be the sort of general view it would give of the whole of a minute object; the working distance being so great, that the minute elevations and depressions in the object itself, being but a very small fraction of the whole distance, would not perceptibly affect the focus. In many respects, this might be a desirable quality; but we are convinced that the microscopist would quite as often find it a source of error in his interpretation of what he might observe. We feel fully assured, that in minute and elaborate investigations the high angle objectives are the most trustworthy. Moreover, the skill of the opticians named has enabled them to increase the angle without diminishing so very much the working distance. The $\frac{1}{4}$ of Mr. Ross, of recent make, and we believe the $\frac{1}{4}$ of that of Powell and Leland, will work through glass .01 ($\frac{1}{100}$) of an inch in thickness.—In speaking of the objectives of the prominent makers, we do not desire to indicate any order of precedence; they are all excellent, and all have peculiarities of their own. We must, however,

be permitted to notice a little more fully the American artists. The oldest optician, and the one who has been most known in connection with the microscope in the United States, is Mr. Charles A. Spencer of Canastota, N. Y. The object glasses furnished by this gentleman, particularly the later ones, are of the highest order; they range from 8 inch to $\frac{1}{16}$ inch. By many of our most experienced microscopists they are considered superior to the best objectives of the London opticians; they are certainly equal to them. Mr. Spencer, in the earlier days of high angle objectives, no doubt surpassed in this respect all the English opticians; his rare skill and nice manipulation enabled him to perform wonderful feats in this direction, far in advance of any thing before accomplished. Mr. Robert B. Tolles, for some time connected with Spencer, but now by himself at Canastota, has devoted himself to the perfection of the achromatic objectives with enthusiastic zeal and unparalleled success. His recent objectives are quite equal in defining and penetrating power to the very best of the London opticians, both with central and oblique illumination, and greatly superior to them in the latter case, as regards chromatic aberration; this is true also of Mr. Spencer's objectives. Mr. Tolles's objectives range from 8 inch to $\frac{1}{16}$ inch. Messrs. J. and W. Grunow of New Haven, Conn. (the former now of New York) have sent out some very fine objectives, ranging from 2 inch to $\frac{1}{16}$ inch. They have not attempted generally so high angles as Spencer and Tolles, but have devoted great attention to the mechanical arrangement and efficiency of their stands, and the accessory apparatus. In this department especially they are unrivalled, and they alone, of the American opticians, have adopted Mr. Wenham's superior mode of adjustment of the high power objectives for thickness of cover.—Of English opticians, the name of Andrew Ross has always been placed foremost, being connected with the greatest improvement of the objective, without which the higher powers of large angle would be almost valueless; we allude to the adjustment for cover. First of all the opticians Mr. Ross made his objectives so perfectly corrected for spherical and chromatic aberration, that a new source of difficulty, apparently almost insurmountable, presented itself. He found that these aberrations, so nicely balanced, were disturbed by each varying thickness of the thin covering glass over the object. The happy expedient he devised to remedy this, was to alter the distance between the first set and the two posterior sets of achromatics composing the objective, by means of a delicate screw collar. This grand and capital improvement, for which Mr. Ross deserves the rank assigned him, has been adopted by all the American and English opticians, and more recently by the French and German. The English uniformly, if we except the amateur efforts of Mr. Wenham, make the front set movable; the American opticians move the two

posterior sets, the front being immovable; the latter method is better, the object being kept easier in view during the adjustment, and there being no danger of bringing the front lens in contact with the object. The objectives of Mr. Ross have always maintained a high character, and have been more expensive than those of Powell and Leland, or Smith, Beck, and Beck, though they probably do not surpass them. The business is now conducted by Mr. Thomas Ross, the son of A. Ross, who has lately died. Mr. Ross's objectives range from 8 inch to $\frac{1}{16}$ inch. Messrs. Powell and Leland, so far at least as the objectives and accessories are concerned, are quite equal if not superior to any living opticians. Both the low and high powers of this firm are of the finest character. While the general plan is the same, there are some peculiarities in their high power objectives worthy of notice. The front set is triple, and the front lens being of crown glass is less liable to injury from wiping, or accidental contact with the object, than the soft flint of other opticians; but as it is a very thin plano-convex, merely cemented to the concave, and not burnished in, it is liable to injury by parting the cement. Messrs. Smith, Beck, and Beck are more widely known in this country than the other firms. Their "students" and "educational microscope" are the forms usually sold by the dealers. As opticians, they stand side by side with the others named; as mechanicians, in some respects, they appear to be in advance. They do not furnish objectives higher than $\frac{1}{4}$ of 125° angle. We have space only to mention the names of Nachet, Oberhauser, and Kellner, whose objectives are excellent, but inferior to the American or English; they are, however, much cheaper, and the mechanical work upon their instruments is very excellent. The name of Prof. Amici of Modena has long been associated with the microscope. The objectives made by him consist of 6 series, with angles varying from 26° to 160°; the higher powers have no adjustment for cover, but the front lens is made slightly concave, and a drop of water introduced between the cover and the objective, thus in a measure rendering the adjustment unnecessary. This contrivance is ingenious but awkward, and is a poor substitute for that suggested by Mr. Ross. Finally, we must not omit to name Mr. Lister, who first pointed out some peculiarities possessed by a combination of 8 achromatics with their plane sides toward the object, the crown and flint being cemented together, and which were the basis of subsequent improvements. The peculiar form adopted by Lister has long since been abandoned, the principles, however, being the same.—The stands furnished by the principal makers exhibit a great variety of patterns, and combine various excellences. The most desirable points, viz., freedom from tremor, ease of illumination, particularly oblique illumination, facility in the application of the accessory apparatus, and delicacy of adjustment, are nearly

equal in the first class stands of the principal opticians; but perhaps, upon the whole, the best are those of Messrs. Smith, Beck, and Beck. Their large stand mounted on two pillars is remarkably steady. The stage, thin but substantial, is large, and its movements are very smooth and delicate. The illuminating and accessory apparatus is carried by a sub-stage below, and most easily applied. The illuminating mirror is large, and so mounted as to give very oblique illumination. The rack-work of the quick adjustment is always of the smoothest and best character in all of the instruments made by this firm, and the slow adjustment very delicate. The greatest fault in this stand is the attachment of the slow movement at the lower part of the tube of the microscope itself. In this respect, the stands of Ross, Powell and Leland, Spencer, Tolles, and the Messrs. Grunow, are superior. With the high powers, the springing of the tube when the finger is applied, and the shaking when the adjustment for cover is attempted, are disagreeable. The larger students' microscope made by this firm is a very fine instrument; the stage movements and adjustments are very complete. The stands furnished by Ross are too heavy and cumbersome; they are, however, exceedingly steady, and finished with extreme care. Those supplied by Powell and Leland are much lighter, and have some peculiar advantages. The accessories supplied by this firm are more complete than those of any other; the stage of their new and largest instrument is very thin, and allows greater obliquity of illumination than that of Smith, Beck, and Beck. Their achromatic condenser is beautifully finished; it has an angle of 170° . The stand itself is not as steady as that of Smith, Beck, and Beck, but the fine adjustment is more conveniently placed. The stands furnished by Messrs. Grunow are of different patterns, but all excellent in beauty of finish, smoothness of adjustment, and steadiness, comparing most favorably with the English work. The stands furnished at Canastota by Spencer and Tolles have many excellences, and are very steady. Their more recent stands evince a most decided improvement in general finish and in the accessories, and we doubt not that the American stands will soon, as already do the American objectives, to say the very least, fully equal the best English work.—All good instruments should have a graduated draw-tube within the main tube, and the latter should be not less than 1.4 inch in diameter. As a general rule, the American microscopes have had too small and short bodies, so that they have appeared, by the side of the English instruments, little and inferior. The draw-tube is absolutely necessary for micrometry, and is very convenient to receive the analyzing prism, erector, or Tolles's amplifier. Two adjustments for focus are also necessary, one quick by rack-work and pinion, the other very delicate by screw. The pinion heads should be large, to allow of most delicate movement, and Messrs.

Smith, Beck, and Beck graduate the head of the screw of the fine adjustment, so that the thickness of covering glass may be measured. A skilful observer may dispense with the rack movement, and produce the approximate adjustment by sliding the tube. This is the method adopted in most of the French instruments, and in the "educational" of Smith, Beck, and Beck. The stage movements should be smooth, and but slightly disturb the adjustment when in focus. The adjustment for wear in the English instruments is by spring, in the American by screws; the former involves more work for the maker, but is better. The lever stage, though performing finely when first from the hands of the maker, is much more liable to derangement than that in which the motions are produced by rack and screw. In the Smith, Beck, and Beck instruments the rack and screw are both so low that the latter passes entirely under the bottom of the stage, which is consequently much thinner than it can be made when the screw is introduced between the movable plates, as is the case with most of the American instruments; the milled heads themselves are thus dropped below the level of the stage, and this is deemed of great importance; this is also the case with Powell and Leland's large microscope.—The usual accessories accompanying the microscope are, an achromatic condenser, a bull's-eye condenser, small condenser, stage and eye-piece micrometers, polarizing apparatus, camera lucida, animalcule cage, stage forceps, glass parabola, erector, Lieberkuhn's and dark wells, frog plate, &c. The name of achromatic condenser has been given to an illuminating apparatus consisting of an achromatic objective of large angle, furnished with a wheel of diaphragms and central stops; when the latter are used, oblique illumination is obtained. This condenser is exceedingly useful in the ordinary studies by the microscope. With the proper adjustment it affords a fine achromatic illumination, revealing the structure of the object with great beauty and clearness; but in unskilful hands it will be of little service. So far as oblique illumination is concerned, we prefer unilateral light, though some particulars of structure are best revealed by aid of the achromatic condenser. The condenser is placed below the main stage, and can be adjusted by independent rack-work, so as to give the best illumination. The condenser of 170° angle, lately introduced by Powell and Leland, is spoken of very highly by the English microscopists; the delicate markings of *navicula rhomboidea*, when viewed with their $\frac{1}{4}$ objective, are stated to be as well defined as those of *pl. hippocampus* viewed with a $\frac{1}{2}$. The achromatic condenser of Smith, Beck and Beck has an angle of about 100° . When used with the central stops, the proper point for adjustment may be determined by removing the eye piece, after the objective has been brought into focus, looking down the tube, and moving the condenser by means of its own rack and pinion, until the black stop appears sharply defined in

the centre of the field, and a bright illuminated ring around it. If the stop is removed, the whole field will appear brightly illuminated, unless the objective be of much greater angle than the condenser. A condenser of greater angle than 100° cannot be used unless the object be placed upon very thin glass; all difficult test objects should be mounted in this manner on a slip of mahogany. The condenser itself, or the carrier, should have some means of adjustment to make its axis coincide with that of the objective; the front set of lenses is generally made to be removed, thus affording an illuminator of lower angle, to use with thicker glass and objectives of low power. In using the achromatic condenser by lamp light, the bull's-eye condenser is employed to render the rays parallel, and the plane side of the mirror is used. —The bull's-eye condenser consists of a thick plano-convex lens, of short focus, mounted upon a stand so that it can be used for the illumination of opaque objects. Very excellent oblique illumination may be obtained by condensing the flame of a candle or lamp, placed at a distance of about two feet from the stage, upon the under surface of the slide, the light being placed in front, and the stage slightly turned up to receive it; or, the microscope being placed horizontal, the light may be off at one side, according to the obliquity desired. As the thickness of the stage will not ordinarily allow illumination at a much greater distance than 60° from the axis, a sub-stage, attached to the upper plate of the main stage, but carrying the slide entirely below it, is furnished by Messrs. Grunow, and by Powell and Leland, and may be readily attached to any microscope; this allows illumination of any obliquity. In using the bull's-eye condenser for this purpose with a lamp, the plane side must be presented toward the object; and if the flame be flat, its edge must be presented. The small condenser is used in the same way as the bull's-eye. Where very intense illumination is desired, the bull's-eye is placed near the source of illumination, with the plane side toward it, so as to render the rays nearly parallel, and then this beam of light is further condensed by the small condenser. —The stage micrometer is a slip of glass ruled into .01" and .001" of an inch; it is used in conjunction with the camera lucida, or to determine the value of the divisions of the eye-piece micrometer. The French scale is the millimètre divided into 100 or 200 parts. The eye-piece micrometer is a finely ruled glass scale, introduced by means of an opening between the field and eye lens of the eye piece, so as to be in the focus of the eye lens. The value of the scale is determined by placing the stage micrometer on the stage, and viewing the divisions with the given objective and eye piece, causing by means of the draw-tube a certain number of divisions of the one to correspond exactly with a certain number of the other; thus, if 10 divisions of the eye micrometer corresponded with one (.01") of the stage micrometer, then

the value of one division of the eye-piece micrometer would be .001", with that particular object glass, eye piece, and length of draw-tube. The stage micrometer being replaced by any object, its dimensions may be readily ascertained by noticing how many divisions of the scale are subtended by it. The micrometers of this description are very convenient, and, when carefully used, accurate. The definition is slightly injured, however; this objection is obviated by Mr. Tolles's solid micrometer eye piece. If the observer has only a stage micrometer, the divisions may be projected on paper by means of the camera lucida; then, with the same objective and eye piece, the image of any object being projected on the paper, its dimensions are at once ascertained. Messrs. Powell and Leland furnish a cobweb micrometer susceptible of great accuracy; it is similar to that used for astronomical purposes. Messrs. Grunow have somewhat improved upon Powell and Leland, and their cobweb micrometer with orthoscopic eye piece is a very delicate instrument. They also furnish Fraunhofer's stage micrometer, which possesses the advantage of giving the absolute dimensions of the object, without reference to the power of the objective or eye piece. With careful use the eye-piece micrometer is as accurate as any of these, and much less expensive. —The polarizing apparatus consists of two Nichols prisms of calc spar with revolving fittings, one (called the polarizer) designed to be placed below the object, the other (termed the analyzer) above, either directly over the eye piece, where it generally cuts off part of the field, or at the lower end of the draw-tube; here, if the prism be a good one and not too long, it will not much affect the definition, and will allow the whole field to be visible. Very much depends upon these prisms. Those supplied by the Messrs. Grunow are very large and fine, and the analyzer is placed by them directly above the objective; it is too large, however, to be placed so low down without injury to the definition. The analyzer of Smith, Beck, and Beck is much shorter than Grunow's, and may be used either over the eye piece or placed in the end of the draw-tube. There is much difference in these prisms; some scarcely injure the definition at all, and others are very poor. The polarizer is usually somewhat larger than the analyzer. The calc spar is very soft, and, if not protected by thin glass covers, as are those of Messrs. Grunow, liable to injury. A set of revolving selenites, to go below the object, between it and the polarizer, is supplied both by Grunow and by the English opticians. There is not much choice in the method of mounting and revolving these prisms; perhaps Grunow's is the most elaborate, but, when the revolving selenites are included, we think Smith, Beck, and Beck's arrangement the most complete. A "selenite stage" is often employed, simply placed under the object, on the stage of the microscope. Mr. Darker has contrived a stage of this kind, in which the

selenites revolve. A complete polarizing apparatus is very important, and should be attached to every good instrument. Sometimes tourmalines are used instead of the prisms of calc spar; they are objectionable on account of their color, but placed over the eye piece do not at all obstruct the field of view.—The camera lucida furnishes the means of drawing or sketching outlines of objects viewed in the microscope, some provision for which is absolutely necessary. Often this is merely a plate of neutral tint glass, which, placed in front of the eye piece, at an angle of 45° , when the microscope is turned horizontal, reflects the image to the eye, and at the same time pencil and paper upon the table may be viewed through the glass. A better contrivance than this is the steel disk of Soemmering, made slightly smaller than the pupil of the eye; this, when placed in front of the eye piece, enables one to view object and paper at the same time. In these contrivances, and also in the Nachet drawing prism, the object, being viewed after but one reflection, is reversed right and left. Where it is necessary to finish a drawing by the eye, this is a serious difficulty; it is therefore preferable in all cases to use the Wollaston prism, which is applied so as to give an unobstructed view of the whole field, and with which the drawing is precisely as it appears in the microscope without the prism. A little practice is required to use it well, but if the observer will take care to have the paper strongly illuminated, while the object is only enough illuminated to see it distinctly, no great difficulty will be found.—The animalcule cage is a simple contrivance by means of which a drop of water may be retained between two glass plates, which may be approximated so as to just confine the object, without allowing, if it be living, too much freedom of movement; it is often made to serve the purpose of a compressor, for crushing soft bodies more or less during the examination.—The stage forceps is exceedingly useful for the examination of small insects. At one end is usually placed a bit of cork, enclosed in a brass cylinder pierced with holes, to receive an insect pin, in case it be desirable to examine cabinet specimens. The forceps should have free movement in all directions. The recent ones supplied by Smith, Beck, and Beck have a ball and socket movement; they are attached to the upper stage plate, and thus are moved by the rack and screw of the stage.—The parabola was originally contrived by Mr. Wenham, and was composed of a silver reflector; it is now made of glass, the outer surface having the form of a parabola. The rays of light, entering the glass through a plane surface below, suffer total reflection, and emerge without refraction, the upper surface of the truncated parabola being concave, so that each reflected ray strikes upon the surface perpendicularly. The glass parabola has a small hole in the axis, carrying a sliding rod, with a small disk, which may be elevated or depressed according to the

angle of aperture of the objective, until the direct light is excluded; the object is then exhibited entirely by oblique light on a dark field. The *polycystina* are beautifully shown by this illumination, and also parts of insects with the lower powers.—The erector consists of two plano-convex lenses, to be inserted into the lower end of the draw-tube; by means of these the object is seen without being inverted. The magnifying power is much diminished, and the definition injured; and one who intends to dissect under the compound microscope, had better at once learn to manipulate without it. The ingenious erecting prism of Nachet may be used, which does not in the least injure the definition. In this case the upright stand of Nachet will be found very steady and convenient.—Lieberkuhn's are polished silver specula fitted to the lower powers, the polished surface being presented to the object; they are used in conjunction with what are termed dark wells, which consist of a slender rod carrying at the summit a blackened cap of brass, and are placed directly under the object so as to cut off the direct light; where the object itself is mounted on an opaque background, they are unnecessary. The light reflected from the mirror below, falling upon the Lieberkuhn, is condensed upon the object. There are many opaque objects which cannot be well seen without this kind of illumination, and it is justly considered a very important addition to the apparatus.—The frog plate is a flat mahogany or metal plate, having a slightly elevated glass platform, and the edge of the plate pierced with holes or furnished with split pins. By means of threads tied to the toes of the frog, the web may be spread out on the plate, the body of the frog being enclosed in a bag and strapped to the plate; care must be taken not to draw the string too tightly around the mouth of the bag where the leg protrudes, as it stops the circulation. The bag may be dispensed with by holding the frog a moment or two in water of 120°F. , when it becomes perfectly rigid and apparently insensible. In this condition it may be opened, and the circulation of the blood in the veins and arteries of the mesentery most beautifully exhibited; care must be taken to keep the parts moist. For the purposes of minute dissection we have found the eye instruments exceedingly useful. Fine scissors and forceps are made for this purpose, of most excellent quality, by Charrière of Paris, and may be had of the dealers in surgical instruments.—In working with the microscope, one should acquire the habit of keeping both eyes open. If the eyes are allowed to rest easy, and then the focus carefully adjusted to suit while thus resting, no great fatigue will be experienced in using the microscope; if, however, the focus is only approximated, and then distinct vision obtained by forcing the eye, severe pain and headache will ensue. The writer has worked with a bright light for 6 or 8 hours, with but slight intermission, without fatigue. Long experience and great caution are requisite in in-

terpreting the phenomena revealed by the microscope, and one soon learns that things are not always what they seem. This, however, cannot be justly urged against its use. When directed by skillful hands, and guided by experience, its revelations are of the most exalted and truthful character. No one can hope to succeed in the department of natural history who is not a skillful microscopist. A north light, coming from the left hand, the stage movements being at the right hand, is the best light for day. At night, the naphtha or coal oil lamp, as now made by Smith, Beck, and Beck, gives the most intense and steady flame. The gas jet is difficult to manage for delicate work.—We have not yet noticed the "test objects." Many of these have been so long known that it seems almost unnecessary to mention them. The markings on the silicious shells of diatoms have been highly recommended. As general tests, they are no doubt very serviceable, but they are not entirely to be relied upon unless the same specimen is used in comparisons, on the same stand, and with the same illumination. In the following table the usual tests, both for direct and oblique illumination, are given:

| Objective, inches. | Angle of aperture. | Direct light. | Oblique light. |
|--------------------|--------------------|------------------------------------|--|
| 2 or 1½ | 20° | Sections of echinus. " of wood. | .... |
| 1 | 28° | Pollen grains, &c. | <i>Pinnularia viridis</i> . |
| ¾ | 38° | Tracheæ of insects. | <i>Coccotheca lanceolata</i> . |
| ⅔ | 80° | <i>Pleurosigma attenuatum</i> . | <i>Pleurosigma fasciola</i> . |
| ⅕ | 100° | <i>Pleurosigma strigosum</i> . | <i>Hyalodiscus Callifornicus</i> . |
| ¼ | 140° | <i>Pleurosigma fasciola</i> . | <i>Navicula rhomboides</i> . |
| 1/12 or 1/16 | 170° | Do. do. | <i>Grammatophora subtilissima</i> of Providence. |

The following table exhibits the lineation of different species of *diatomaceæ* which have been employed as tests; the measurements are those of Messrs. Sullivant and Wormley:

| | Tests. | Stria in 1-1000 of an inch. |
|---------------------|--|-----------------------------|
| 1..... | <i>Pleurosigma formosum</i> . | 86 diag. |
| 2..... | " <i>strigile</i> . | 80 trans. |
| 3..... | " <i>Balticum</i> . | 86 " |
| 4..... | " <i>attenuatum</i> . | 86 " |
| 5..... | " <i>hippocampus</i> . | 88 " |
| 6..... | " <i>strigosum</i> . | 42 diag. |
| 7..... | " <i>quadratum</i> . | 45 " |
| 8..... | " <i>elongatum</i> . | 48 " |
| 9..... | " <i>lacustre</i> . | 42 trans. |
| 10..... | " <i>angulatum</i> . | 50 diag. |
| 11..... | " <i>fasciola</i> . | 56 trans. |
| 12..... | <i>Navicula rhomboides</i> . | 70 " |
| 13..... | <i>Nitzschia sigmoides</i> . | 70 " |
| 14..... | <i>Colletonema vulgare</i> . | 78 " |
| 15..... | <i>Grammatophora subtilissima</i> , Greenport. | 70 to 75 trans. |
| Do. do. Providence. | | 75 to 80 " |
| 16..... | <i>Synedra capitata</i> , hoop of. | said to be 75 " |
| 17..... | <i>Amphipleura pellucida</i> . | 180 " |

About the last we have great doubts; Mr. Sollitt and Mr. Lobb claim to have resolved it. From experiments with the Nobert test plate, and from the most careful examination with the best English and American objectives, the most

experienced American microscopists believe there is some mistake in this supposed resolution. In judging of the merits of an objective, it appears to us oblique illumination has been too much dwelt upon. The angle of aperture having been ascertained, the general merits will be much more apparent by use of tests, Nobert's lines for example, with the best central illumination. If the scale of *podura plumbea* is employed, select a medium-sized rather than a large one. The wedge-shaped dots should be sharply defined, without fog or mist. The scales of the American *podura* are not dotted but lined, and are not so suitable.—See Robin, *Du microscope* (Paris, 1849); Hartung, *Het Mikroskop* (Utrecht, 1852; translated into German by Dr. Theile, Brunswick, 1859); Quekett "On the Use of the Microscope" (2d ed., London, 1852); Wythes, "The Microscopist" (Philadelphia, 1853); Schacht, "The Microscope," edited by Currey (London, 1855); Griffith and Henfrey, "Micrographic Dictionary: Introduction" (London, 1856); Beale, "How to work with the Microscope" (London, 1857); Carpenter, "The Microscope and its Revelations" (London and Philadelphia, 1857); Hogg, "The Microscope" (London, 1858); Gosse, "Evenings at the Microscope" (London and New York, 1859); West, "Half Hours at the Microscope" (London, 1859); Beale, "Application of the Microscope to Clinical Medicine" (2d ed., London, 1859); Clarke, "Objects for the Microscope" (London, 1859); "Transactions of the Microscopical Society of London;" "Quarterly Journal of Microscopical Science" (London); and Sir David Brewster's paper read at the meeting of the British association for the advancement of science, 1860, on "Microscopic Vision and a new Form of Microscope."

MICROSCOPIC ANIMALS. See ANIMALCULES.

MIDAS, a mythical king of Phrygia, son of Gordius, and, according to some authorities, of Cybele. Having conferred a favor on Bacchus, the god desired him to ask whatsoever he pleased. Midas requested that every thing touched by him should be transformed into gold. The request was granted, but as his food underwent the metamorphosis as well as all things else, he was reduced to a state of starvation, and implored the god to recall his grant. Bacchus bade him bathe in the Pactolus; and Midas having done so, instantly his touch lost its auriferous power in the case of all things essential to life, while the sands of the river were converted into gold. Midas was once chosen umpire in a musical contest between Pan and Apollo; he awarded the palm to Pan, in revenge for which Apollo changed his ears into those of an ass. Midas, to hide this deformity, used to wear a lobed cap; but the slave whose business it was to cut his hair became privy to the secret, which so troubled him that, afraid to reveal it to a fellow mortal, and unable to keep it to himself, he dug a hole in the earth, and whispered into it: "King Midas has asses' ears." He then filled up the hole, but a reed sprang up on the spot which

as often as the wind blew, whispered his words to the world. Midas is said to have killed himself by drinking the blood of an ox.

MIDDELBURG, or **MIDDLEBURG**, a town of Holland, capital of the province of Zealand, situated near the centre of the island of Walcheren; pop. in 1856, 14,000. The town is circular, and surrounded by a ditch and a mound, the top of which forms a favorite public promenade. It has several excellent educational establishments, and various manufactures. The town hall was built by Charles the Bold in 1468, and is ornamented with 25 colossal statues of counts and countesses of Flanders. The town was founded in 1182, and was taken by the Dutch from the Spaniards in 1574. The British lost 7,000 men here from the effects of the climate during the famous Walcheren expedition in 1809.

MIDDLE AGES. See **HISTORY**.

MIDDLEBURY, a township and village, capital of Addison co., Vt., on both sides of Otter Creek river at Middlebury falls, and on the line of the Rutland and Burlington railroad, 81 m. S. from Burlington and 59 m. from Montpelier; pop. in 1850, 8,157. A marble quarry at this place, affording some fine qualities for statuary, is worked by a company, and yields large quantities for exportation. It is the seat of Middlebury college, founded in 1800, and having in 1859 a president, 6 instructors, 85 students, 984 alumni, and a library of 9,000 volumes. There are in the village a cotton factory, a woollen factory, a grist mill, and an iron foundry actively employed, a court house, a bank, and 5 churches (Baptist, Congregational, Episcopal, Methodist, and Roman Catholic). The township contains 2 post offices, an academy, a female seminary, and a number of schools.

MIDDLESEX, the name of counties in 4 of the United States. I. A N. E. co. of Mass., bordering on N. H., bounded S. E. partly by the river Charles, and drained by the Merrimack, Nashua, and Concord rivers, and other streams; area, 888 sq. m.; pop. in 1855, 194,028. The agricultural productions in 1855 were 560,329 bushels of potatoes, 331,984 of Indian corn, 76,674 of oats, and 46,822 of rye. The immense water power supplied by a number of streams is largely employed in manufactures, in which the industry of the people is principally engaged. In 1855 there were 48 cotton, 10 woollen, 4 carpet, and 8 rolling mills; 2 calico, 8 worsted, 4 glass, 18 hat and cap, and 21 paper manufactories, 61 of railroad cars and other vehicles, and 10 of patent and enamelled leather; 89 currying establishments, and 23 tanneries. There were 1,388,119 pairs of boots and 6,527,105 pairs of shoes made; and 4 daily and 10 weekly newspapers were published. The value of the productions of the county of all kinds in 1855 was \$58,205,633. In 1850 there were 204 churches, and 26,238 pupils attending public schools. Several railroads intersect the county, and others connect the principal towns, including Boston. Shire towns, Concord, Cambridge, and Lowell. II. A S. co. of Conn., bordering

on Long Island sound, and intersected by the Connecticut river, which also forms a part of its E. boundary; area, about 430 sq. m.; pop. in 1850, 30,680. The surface is somewhat uneven and the soil generally fertile. Several streams furnish water power, and there are a number of manufactories. The productions in 1850 were 228,738 bushels of potatoes, 95,118 of Indian corn, 50,549 of rye, 28,510 of oats, 23,409 lbs. of wool, 501,128 of butter, and 88,579 tons of hay. There were 8 cotton, 11 woollen; and 2 paper factories, 9 grist and 40 saw mills, 2 founderies, 7 tanneries, 4 newspaper offices, 65 churches, 1 college, and 7,087 pupils attending public schools. The New Haven and New London railroad passes through the southern part of the county. Shire towns, Middletown and Haddam. III. A central co. of N. J., intersected by the Raritan river, and bounded E. by Raritan bay and Staten Island sound; area, 339 sq. m.; pop. in 1855, 32,408. The surface is level toward the S. E. and undulating in the N. and N. E.; and the soil, which varies from a light sand to a deep clay, is generally fertile. The productions in 1850 were 438,668 bushels of Indian corn, 213,954 of oats, 123,076 of potatoes, 78,022 of wheat, 501,648 lbs. of butter, and 5,587 of wool. There were 8 distilleries, 8 cotton factories, 8 India rubber manufactories, 14 flour and 20 saw mills, 8 potteries, 7 tanneries, 47 churches, 5 newspaper offices, and 3,221 pupils attending public schools. The Camden and Amboy and the New Jersey railroads traverse the county, the latter passing through the capital, New Brunswick. IV. A S. E. co. of Va., bordering on Chesapeake bay at the mouth of the Rappahannock river, which forms its N. E. boundary, and bounded S. W. by the Piancotank river; area, 170 sq. m.; pop. in 1850, 4,394, of whom 2,342 were slaves. It has a sandy, but fertile soil. The productions in 1850 were 184,258 bushels of Indian corn, 30,762 of wheat, and 5,230 lbs. of wool. There were 8 grist mills, 5 saw mills, 1 tannery, 9 churches, and 152 pupils attending public schools. Value of real estate in 1856, \$356,296, being an increase of 21 per cent. since 1850. Capital, Urbana.

MIDDLESEX, a S. W. county of England, bounded N. by Hertfordshire, E. by Essex, S. E. by Kent, S. by Surrey, and W. by Surrey and Buckinghamshire; area, 282 sq. m.; pop. in 1851, 1,886,576. It is the smallest county in the kingdom except Rutland, but the greatest in population, wealth, and importance, its capital being London, which occupies 51 sq. m. of the county. Much of the land is devoted to market gardening, though more of it is in meadow and pasture, the cows kept for the supply of the metropolis with milk numbering over 7,000. Middlesex is divided into 6 hundreds and 208 parishes, 118 of which are within the cities of London and Westminster. It returns 14 members to parliament, 2 of whom are for the county. The chief towns, beside London, are Brentford, Staines, and Uxbridge.

MIDDLE THIBET. See **LADAKH.**

MIDDLETON, the name of a distinguished family in the history of South Carolina. I. **EDWARD**, its founder, was a native of Twickenham, England, where he inherited a large property, which is still owned by one of his descendants. He removed to South Carolina, and was one of the members of the council under the lords proprietors in 1680, little more than 10 years after the first settlement of the colony. He evinced decided republican tendencies, and opposed the governors in favor of popular rights and privileges. II. **ARTHUR**, son of the preceding, was conspicuously engaged in public affairs as a member of the council as early as 1712. His property and talents gave him political influence, which he exerted in favor of popular claims, opposing the close borough system of the lords proprietors, and finally heading the revolution which threw off the whole proprietary government and placed the colony under the immediate protection of the crown (1719). He was probably the writer of the plan of association, which was submitted to the people at a militia gathering, for uniting the opposition movement throughout the province. He was president of the popular convention which declared the proprietors to have forfeited their rights under the charter, a declaration which was subsequently confirmed by a decision under the crown; and he was the spokesman in the proceedings by which the governor was formally deposed by the popular government. In 1725 he succeeded Nicholson as governor of the colony, which office he held till 1731, after which he remained in the royal council. His administration was partly occupied by war and negotiations with the Spaniards of Florida and the French of Louisiana. Hewitt, the historian of South Carolina, who regarded unfavorably his republican tendencies, speaks of him in terms of moderate praise. III. **THOMAS**, third son of the preceding, distinguished himself in 1761 in command of a provincial regiment against the Cherokees, cooperating with Col. Grant, who was at the head of the regulars. A disagreement ensuing, he caned the colonel in the streets of Charleston, and a duel with pistols followed, but neither party was hurt. The affair led to great bitterness of feeling between the natives and the British residents. IV. **HENRY**, brother of the preceding, was an aged man at the outbreak of the revolution, but was sent as a delegate from South Carolina to congress, of which body he was president in 1775. He was an invalid on his plantation during most of the period when South Carolina was in possession of the British. V. **ARTHUR**, son of the preceding, and a signer of the declaration of independence, born at the family seat on Ashley river in 1743, died Jan. 1, 1787. At the age of 15 he was sent to Harrow school, England, whence he passed to Westminster school, and in 1764 to the university of Cambridge, where he took his degree. He returned to America, married, and soon

after revisited Europe, and made a tour of two years on the continent. On his return he established himself as a planter, but was soon prominent as a leader of the revolutionary party in South Carolina. He was one of the most decided and efficient members of the first council of safety. His correspondence at that time with William Henry Drayton is especially interesting and valuable for the light which it throws on the social condition of the colony. Its interests, being chiefly agricultural, suffered little from British hostility; many of the inhabitants were British by birth; this colony, moreover, had been particularly favored by the government of the Georges; and it therefore required all the eloquence and ability of the principal citizens to reconcile the body of the people to the revolution. In this cause Mr. Middleton was one of the most zealous. In 1776 he was sent as a delegate of the state to congress, and as such affixed his signature to the declaration of independence. He and Hancock were very intimate, lodged together, and dispensed a liberal hospitality, which made their hotel a favorite place of reunion for distinguished persons. He held his seat in congress until 1777, declined the governorship of South Carolina in 1778, took the field for the defence of Charleston in 1779, saw his plantation devastated by the British, was made a prisoner after the fall of Charleston in 1780, and was one of the leading citizens who were kept in confinement as hostages. His estate was sequestered, and he was shipped to the castle of St. Augustine, and thence transferred to the Jersey prison ship. Exchanged in the latter part of 1780, he served till the close of the war as a delegate in congress, and was afterward elected to the state senate. He was a skilful stenographer, a rare accomplishment at that time, and took down many of the debates in which he participated. He wrote effective political essays under the signature of "Andrew Marvell." VI. **JOHN IZARD**, second and youngest son of the preceding, born at the family seat on Ashley river in 1785, died in Paris in Nov. 1849. He was educated at the university of Cambridge, England, and remained abroad to gratify his tastes for art, poetry, and music. During the last 25 years of his life he resided in Paris. In 1810 he married the daughter of M. Falconet, the banker of Naples, and was afterward received on intimate terms in the circles of Mme. de Staël and Mme. Recamier. His work on "The Cyclopean Walls" (fol., London, 1812) shows his familiarity at once with classical literature and with the details of art. VII. **HENRY**, son of Henry Middleton, who was for many years U. S. minister to Russia, born in 1797, in Paris, where his family was sojourning during a tour of pleasure. He was educated in South Carolina under private tutors till the age of 16, when he was sent to West Point, where he was graduated. He afterward attended the law lectures in Litchfield, Conn., pursued the study for two years in Europe, and was admitted to the bar in Charleston in 1822. He has never practised

the profession, but has devoted himself to writing on topics of government, politics, and political economy. He visited Europe in 1835, and remained several years; repeated his visit in 1850, married in England, and returned in 1859. His publications include many small volumes and pamphlets, chiefly on current political and economic questions.

MIDDLETON, CONYERS, D.D., an English clergyman and scholar, born in Richmond, Yorkshire, Dec. 27, 1683, died in Hildersham, Cambridgeshire, July 28, 1750. He was graduated at Trinity college, Cambridge, in 1702, was ordained deacon soon afterward, was elected a fellow of his college in 1706, and in 1708 signed the petition against Bentley, the master. This was the commencement of a controversy between Middleton and Bentley, long continued within the walls of the university, in pamphlets, and in the courts of law. When Middleton with 8 others in 1717 was nominated D.D. by the king, Bentley, who was then regius professor of divinity, would only grant them the degree on payment of 4 guineas over the usual fee. Middleton complied with the demand, but brought the case before the vice-chancellor; and Bentley, refusing to acknowledge the jurisdiction of that officer, was dismissed from his professorship and stripped of all his degrees. Middleton published two pamphlets giving an account of the affair, which first attracted attention to him as a polished and learned writer. Soon afterward he put forth another pamphlet on the government of Trinity college as administered by Bentley. Having stated in it that there was no court in the kingdom before which the fellows could bring their complaints, his great adversary sued him for libel on the administration of justice in the kingdom, and the jury found him guilty; but sentence was suspended on Middleton's begging Bentley's pardon and paying the costs. When Bentley published proposals and a specimen for a new edition of the Greek Testament, Middleton attacked it in a severe critique, and descended to the lowest personal abuse. Bentley revenged himself in 1723 by prosecuting him for a libel on the court of king's bench, in the dedication of a plan which he had drawn up for arranging the university library (of which he had been made principal librarian, an office created expressly for him), and he was fined £50. In 1726 Middleton published an attack upon the medical profession, entitled *De Medicorum apud Veteres Romanos degentium Conditione Dissertatio*. In 1729 appeared his "Letter from Rome" (which he had visited in 1724), in which he attempted to show that "the religion of the present Romans was derived from their heathen ancestors." He also attacked the miracles of the Roman Catholic church in a way which awakened a suspicion of his disbelief in the miracles of the New Testament. A letter to Dr. Waterland published in 1731 gave still more serious offence to the clergy, and Middleton found it necessary to publicly avow his be-

lief in Christianity, but his avowal received little credit. He held that the Gospels were full of contradictions, that the apostles were sometimes mistaken in their application of the prophecies to Christ, and that the account of the fall of man was a fable or allegory. About this time he was appointed to the Woodward professorship of natural history, but soon resigned it. In 1785 he published "A Dissertation concerning the Origin of Printing in England," and in 1741 his most popular work, "The History of the Life of M. Tullius Cicero" (2 vols., London), which Macaulay calls "a lying legend in honor of St. Tully." This was followed by a translation of the correspondence of Cicero and Brutus, together with a defence of its authenticity (1748), and a "Free Inquiry into the Miraculous Powers which are supposed to have subsisted in the Christian Church from the Earliest Ages" (1749), which exposed him again to the charge of infidelity, and was generally condemned as subversive of religion. In 1750 appeared his "Examination of the Bishop of London's (Dr. Sherlock) Discourses concerning the Use and Intent of Prophecy." His works, with the exception of the "Life of Cicero," were collected and published in 1752, in 4 vols. 4to.

MIDDLETON, THOMAS, an English dramatist, born in the latter part of the 16th century, died in July, 1627. Almost the only event of his life known to us is that he was appointed chronologer or city poet of London in 1620. Jonson, in a letter to the earl of Newcastle in 1631, says in reference to the salary connected with this office: "Yesterday the barbarous court of aldermen have withdrawn their chauntary pension for verjuice and mustard—£33 6s. 8d." He was associated with Jonson, Fletcher, Massinger, and Rowley in the composition of several plays. His own productions are very numerous; three of them, "A Mad World, my Masters," "The Mayor of Queenborough," and "The Roaring Girl," are in Dodaley's collection. His "Game at Chess," performed in 1624, gave umbrage to the court on account of its allusions to the king and ambassador of Spain, and Middleton and the players were brought before the privy council and censured for their audacity in "bringing modern Christian kings upon the stage." A play of his called "The Witch" is that whence Shakespeare has been supposed to have borrowed the witchcraft scenery and part of the incantations in "Macbeth;" although it is not improbable that the reverse was the case, and that Middleton borrowed his play from Shakespeare.

MIDDLETON, THOMAS FANSHAW, D.D., an English classical scholar, born in Kedleston, Derbyshire, Jan. 26, 1769, died in Calcutta, July 8, 1822. He was educated at Christ's hospital, London, and Pembroke hall, Cambridge, received orders, and enjoyed various preferments. He edited for some time a periodical called the "Country Spectator," and wrote "The Doctrine of the Greek Article applied to the Criticism and Illustration of the

New Testament" (London, 1806). When Calcutta was erected into an episcopal see, he was made its first bishop, and was consecrated at Lambeth, May 8, 1814. Some of his sermons, charges, and tracts were collected and published in London in 1824, by Dr. H. K. Bonney.

MIDDLETOWN, a township, city, port of entry, and half shire town of Middlesex co., Conn., on the right bank of the Connecticut river, at the head of ship navigation, 28 m. from its mouth, 24 m. N. E. from New Haven, 15 m. S. from Hartford, and 35 m. N. W. from New London; pop. of the township in 1860, 8,688; of the city, 5,183. The city has a gradual ascent from the river, with which the principal streets run parallel, crossed at right angles by others; it is well built, chiefly of brick, and has many fine situations and elegant mansions in the environs. It has a custom house built of Chatham freestone, and a court house. It is the seat of the Wesleyan university, under the direction of the Methodists, and of the Berkeley institute, an Episcopal divinity school. In 1860 Middletown had 16 churches (1 African, 2 Baptist, 5 Congregational, 2 Episcopal, 3 Methodist, 1 Roman Catholic, 1 Scotch Presbyterian, and 1 Universalist), 8 banks of issue and 4 savings banks, 6 grist mills, 5 saw mills, 8 cotton factories, 8 iron founderies, and various other manufacturing establishments. The wharfs have 10 feet of water, and can accommodate such vessels as can cross the bar. The tonnage of the district in 1859 was 15,117, of which 8,578 was steam.

MIDGE, a small fly. See **DIPTERA**.

MIDIANITES, a nomad or half-nomad people of northern Arabia, who, in the time of the early history of the Hebrews, dwelt in the vicinity of the Red and Dead seas, especially between Mt. Sinai and Moab. They are derived in Scripture from Midian, the son of Abraham by Keturah, and appear occasionally as merchants, and more frequently, like Bedouins, making raids into the neighboring territories of the Jews. Moses, who was himself the son-in-law of a Midianite priest, Jethro, waged a war of extermination against those of their tribes who in conjunction with the Moabites had enticed the Hebrews to idolatry when they were approaching Canaan. Gideon seems to have broken their power by his great victory over them and their allies the Amalekites. Some critics, in order to remove difficulties arising from apparently contradictory scriptural statements about this people, distinguish between Abrahamite and Cushite tribes of the same name, the former of whom, descendants of the same Semitic stock, lived in hostility to the Hebrews, while the daughter of Jethro is identified with the Cushite wife of Moses, mentioned in another part of his history (Num. xii. 1).

MIDLAND, an E. co. of the southern peninsula of Mich., bordering on Saginaw bay, intersected by Tittibawassee river, and drained by its branches, the Chippewa, Salt, and Pine rivers; area, 650 sq. m.; pop. in 1850, 65. The

surface is level and the soil fertile. The productions in 1850 were 1,650 bushels of corn, 750 of potatoes, 50 tons of hay, and 128 lbs. of wool. Capital, Midland City.

MIDLOTHIAN. See **EDINBURGHSIRE**.

MIDSHIPMAN, the junior grade of officers in the line of promotion in the naval service. The number of midshipmen and passed midshipmen in the U. S. navy is limited by law to 464, and no one can be appointed unless he is a graduate of the naval academy at Annapolis, Md. The members of this institution are denominated "acting midshipmen," and the appointments are distributed by law among the states and territories which have not their relative proportion on the navy list; and it is further required that the appointments from each state shall be apportioned as nearly as practicable equally among the several congressional districts therein; that the person appointed shall be an actual resident of the congressional district from which he is appointed, and be recommended by the member of congress for that district. Candidates must be over 14 and under 18 years of age at the time of the examination for admission; must be free from deformity, disease, or imperfection of the senses; must be of good moral character, able to read and write well, writing from dictation, and spelling with correctness, and to perform with accuracy the various operations of the ground rules of arithmetic, viz., numeration, and the addition, subtraction, multiplication, and division of whole numbers. The examinations to which they are subjected upon these points are, first, by a board of three surgeons, and then by one of professors. If found qualified, they become members of the academy, their actual travelling expenses from their place of residence to the institution are paid by the government, and they are placed upon a pay of \$500 per annum. The course of instruction at the naval academy, which embraces a period of 4 years, includes mathematics, astronomy, navigation and surveying, ethics and English studies, natural and experimental philosophy, French and Spanish, drawing, artillery and infantry tactics, practical seamanship, naval gunnery both theoretical and practical, the steam engine, &c. During the academic course 2 cruises of about 8 months each are made in a ship of war for instruction. Warrants as midshipmen are conferred upon the graduates of the academy, who take rank in the order of merit. After 2 years of actual sea service, midshipmen, if they produce a favorable testimonial from their commanders, are entitled to a final examination for promotion, which is made by a board composed of 8 captains and 2 commanders. This examination is on the practical branches of the profession, and includes seamanship and naval tactics, practical navigation, gunnery, and the steam engine. Having passed this, they receive new warrants as passed midshipman, with increased pay; and promotion to the higher grades of the service, which are master, lieutenant, comman-

der, and captain, is open to them.—In the British navy, young gentlemen intended for commissioned officers are educated, in the first instance, at the royal naval college; and afterward, while serving at sea and until their promotion to a higher grade than midshipman, they are obliged to devote a portion of their time to study under the superintendence of a competent "instructor," who is often the chaplain of the vessel. Some of the appointments from the college are made directly by the lords of the admiralty, and others by the commander of a ship making selections from among the pupils at college, subject afterward to their lordships' approval. The first 18 months' service afloat are passed as "cadets," and the next 8½ years as midshipmen; when, provided they pass the requisite examination to qualify them to become lieutenants, and are 19 years of age, they are rated mates. The pay of a cadet is £16 14s. 7d. per annum, and that of a midshipman £31 18s. 9d. They are considered as the principal petty officers, and rank comparatively with ensigns in the army, but have no specific duties assigned to them. In smaller vessels some of the senior midshipmen are intrusted with the watch; they take charge of boats and small parties of men going ashore, pass the word of command, and see that the orders of their superiors are carried into effect. A midshipman's share of prize money is the same as that of a petty officer, a cadet's equal to that of the captains of the tops; and both receive the rations of seamen. There is no limit put by law to the number at any time in the British service; but it is regulated by the number and class of ships in commission, each description of vessel being allowed a certain fixed complement of midshipmen.—The French *aspirants de marine* occupy a similar position and perform similar duties to those of the midshipmen of the American navy. They are of two classes; are especially educated for their profession at the naval academy at Brest, and undergo a strict examination before receiving their appointment afloat, where they serve from the age of 19 to 20 years. They are not entitled to command a ship till they have attained the age of 21.

MIDWAY, a village of Baldwin co., Ga., on the Milledgeville and Gordon railroad, 1½ m. S. from the former; pop. in 1850, about 800. It is the seat of Oglethorpe university (Presbyterian), founded in 1838, which in 1859 had a president and 4 professors, 97 students, 281 alumni, and a library of 4,500 volumes.

MIDWIFERY. See OBSTETRICS.

MIEL, JAN, called by the Italians Giovanni della Vite, a Flemish artist, born near Antwerp in 1599, died in Turin in 1664. His easel pictures of fairs, carnivals, hunting parties, market scenes, gypsies, &c., are his best works.

MIERIS. I. FRANCISCU, the elder, a Dutch painter, born in Leyden in 1635, died in 1681. He was a pupil of Gerard Douw, and painted pictures of *genre*, and occasionally portraits, all remarkable for delicacy of finish, accuracy

of drawing, and correctness of design. His pictures are not numerous, and bring very large sums. He died a prisoner for debt in consequence of an extravagant course of life. II. WILHELMUS, son of the preceding, born in Leyden in 1662, died there in 1747. He was the pupil of his father, and equalled him perhaps in delicacy of finish, though he was inferior in color, drawing, and design. He attempted historical subjects in combination with landscape, and a picture by him of Rinaldo asleep on the lap of Armida became so popular that he was obliged to paint a number of copies. His domestic subjects are held in high estimation and bring large prices. III. FRANCISCU, the younger, son of the preceding, born in Leyden in 1689, died in 1768. He studied painting with his father, and executed similar subjects, although in a much inferior manner. He also made numerous copies of the works of his father and grandfather, which frequently pass for originals with inexperienced purchasers. He was an industrious student of history, and wrote a number of works in Dutch relating to the Low Countries, including a *Historie der Nederlandische Vorsten* (8 vols. fol., the Hague, 1732-'5), and *Groot Charterboek der Graven van Holland, Zeeland en Vriesland* (4 vols., Leipsic, 1753-'6). He was engaged upon a history of Leyden at the time of his death.

MIEROSLAWSKI, LUDWIK, a Polish writer and general, born in Nemours, France, about 1818. He is the son of a Polish officer, who had served in the army of the duchy of Warsaw and under Davoust, by a French woman, and was educated at the military school in Kalisz. He joined the revolutionists in 1830, served with distinction in the campaigns of the following year, and after the fall of Warsaw removed to France, dividing his time in Paris between pleasure and study. He published various books, mostly of little value, in Polish and French, and among others some works on the Polish revolution of 1830-'31, which gained him a reputation as a writer on military affairs. He became the idol of the younger part of the Polish emigrants, and was finally selected by the democratic organization at Paris as principal leader for the next rising of Poland. This failed, however (1846), and Mieroslowski, who had arrived in Prussian Poland, was arrested, tried at Berlin with a number of his fellow conspirators, and sentenced to death. He showed himself worthy of the high position he had assumed by his courage and dignity during the trial; but when the Berlin revolution of March, 1848, opened his prison, and he received a public ovation in the capital of his enemy, he immediately hastened to the duchy of Posen, and inconsiderately armed for another Polish rising. The new Prussian ministry, which at first made the most encouraging promises in favor of Polish liberty, soon adopted a different policy, and a bloody conflict was the result. The Poles, in small unorganized bands, mostly without cannon and ammunition, fought with desperate valor, and

gained a signal victory at Miloslaw; but after some reverses Mieroslawski resigned his command, and the insurgents were disarmed (May, 1848). He returned to Paris, whence he was summoned to Sicily early in the following year, to take command of the revolutionary forces. The affairs of the island were in a desperate condition, and Mieroslawski, who was wounded in the defence of Catania (March, 1849), left his post. Once more he took command of a revolutionary army in Baden, but with still slighter chances of success; and after a few encounters with the Prussians he was obliged to retire to the fortress of Rastadt, which surrendered soon after (July, 1849). He again returned to Paris, and has since published several new works on the history of Poland.

MIFFLIN, THOMAS, an American revolutionary general, born in Philadelphia in 1744, died in Lancaster, Penn., Jan. 20, 1800. He was by birth and education a Quaker, and, after a tour through Europe, commenced business in Philadelphia with his brother. He entered public life in 1772 as a representative from Philadelphia in the colonial assembly, and in 1774 he was a delegate to the first continental congress. At the first outbreak of hostilities in Massachusetts he enrolled himself in the military service, and in June, 1775, accompanied Washington to Cambridge as his first aide-de-camp, with the rank of colonel. He subsequently held the appointment of adjutant-general, and in the spring of 1776 was commissioned as a brigadier-general. He fought with reputation in the battle of Long island, and by his energy succeeded in the latter part of 1776 in raising considerable reinforcements in Pennsylvania to recruit the thinned ranks of Washington's army. He was present at the battle of Trenton, and did good service in driving back the enemy's line of cantonments from the Delaware. In 1777 he was made a major-general, and in the same year became an active member of the faction organized for the purpose of placing Gates at the head of the continental army, and known in history as the "Conway cabal." The project failing, he resigned his commission, and in 1788 was elected to congress, of which body he became president at the close of the same year. In this capacity he received from Washington the resignation of his commission as commander-in-chief. In 1785 he became speaker of the Pennsylvania legislature, and in 1787 he was a member of the convention which framed the federal constitution. In Oct. 1788, he succeeded Franklin as president of the supreme executive council of Pennsylvania, which position he filled for two years; and in 1790 he was chosen governor of Pennsylvania under the constitution adopted in that year. In 1794, while holding this office, he rendered important assistance to Washington in quelling the "whiskey insurrection." He held the office of governor for 9 years, and died soon after returning to private life.

MIGNET, FRANÇOIS AUGUSTE ALEXIS, a French historian, born in Aix, May 8, 1796.

He was educated in Avignon, and in 1815 commenced the study of law in his native city, where Thiers became his fellow student and friend. In 1818 he was called to the bar, and two years later obtained a prize offered by the academy of Nîmes for an essay on Charles VII. The acquisition in 1821 of a more important prize proposed by the academy of inscriptions and belles-lettres, for a dissertation on the state of the government and legislation of France during the age of Louis IX., induced him to abandon the law for the pursuit of letters, and in company with Thiers he removed to Paris. His liberal political views soon recommended him to the editor of the *Courrier Français*, to the staff of which he remained attached for upward of 10 years; and about the same time he commenced a course of historical lectures at the Athénée which gained him a considerable reputation. In 1824 appeared his first important publication, *Histoire de la révolution Française de 1789 à 1814* (2 vols. 8vo., Paris), a work frequently reprinted in France, and translated into the principal European languages. In 1830 he associated himself with Thiers and Armand Carrel in the establishment of the *National* newspaper, and, having coöperated in the overthrow of the Bourbon dynasty, was appointed by Thiers upon his accession to office councillor of state and director of the archives in the ministry of foreign affairs. In 1832 he was elected to the institute as a member of the department of moral and political science, of which in 1837 he became the perpetual secretary; and in the same year he gained admittance to the academy. The only public office which he filled during the reign of Louis Philippe was a mission to Spain on the accession of Isabella II. to the throne. His political views, like those of Thiers, were so distasteful to the government of Lamartine, that in 1848 he was removed from his office of director of the foreign archives and of councillor of state, and has since taken little part in public affairs. The nature of his occupation under Louis Philippe has determined the character of several of his most important works. Among these are a series of documents entitled *Négociations relatives à la succession d'Espagne sous Louis XIV.*, with an introduction (4 vols. 8vo., Paris, 1836-'42), constituting a complete history of the reign of Louis XIV.; *Antonio Perez et Philippe II.* (8vo., 1845); *Vie de Franklin* (1848), one of the best of the minor biographical works published under the auspices of the institute; *Histoire de Marie Stuart* (3 vols. 8vo., 1851); *Charles Quint, son abdication, son séjour et sa mort au monastère de Yuste* (1854), &c. In his capacity of secretary of the section of moral and political science he produced between 1836 and 1843 a number of biographical papers, which were published in the latter year under the title of *Notices et mémoires historiques* (2 vols. 8vo.); and he has also contributed many articles to the *Journal des savants*, the *Revue des deux mondes*, and other periodi-

cala. For more than 80 years he has been engaged upon a history of the reformation, in the preparation of which he has collected hundreds of volumes of manuscript correspondence.

MIGUEL, DOM MARIA EVARISTO, a Portuguese prince, born in Lisbon, Oct. 26, 1802. He is the 8d son of John VI. of Portugal, and of Carlotta Joachima, a daughter of Charles IV. of Spain, and spent his early life with his parents in Brazil. His education was so much neglected and his vicious disposition so little checked, that on his return with the royal family to Portugal (1821) he became notorious for his ignorance and brutality. His elder brother Dom Pedro had no sooner accepted the dignity of emperor of Brazil (May, 1822), and his father established a constitutional monarchy in Portugal (October), than Dom Miguel, instigated by his unscrupulous mother, and aided by several of the nobility and clergy and by a large part of the troops, formed plots against the new constitution. His father was for some time a mere puppet in his hands, and, notwithstanding his revolutionary attempts in 1822 and 1823, invested him with the command of the army. Early in 1824 the assassination of the marquis de Loulé, one of the most cherished servants of the crown, took place, and Dom Miguel was generally regarded as a party to this crime. Soon afterward, under the pretence of endeavoring to frustrate conspiracies against his father's life, he caused the ministers and other public officers to be arrested, and the king's throne was only saved by the intervention of the foreign powers. Together with his mother, Dom Miguel was now expelled from the country (May 12). He repaired first to Paris, and afterward to Vienna, where Mr. Hülsenmann, the present Austrian ambassador at Washington, became his mentor. His father died in May, 1826, and his sister Isabella Maria officiated for a short time as regent of Portugal in the name of Dom Pedro, emperor of Brazil, who as the eldest son was the legitimate successor to the European and colonial possessions of the house of Braganza. After granting a constitution with an upper and lower chamber (April 23, 1826), Dom Pedro relinquished the throne of Portugal (May 2) to his daughter, Dona Maria (afterward Dona Maria II. da Gloria), then in her 7th year, offering her hand in marriage and the regency during her minority to her uncle Dom Miguel. The latter was officially appointed to the regency, July 3, 1827, and after his arrival in Lisbon immediately assumed the administration, taking the oath to maintain the constitution (Feb. 26, 1828). The absolutists, however, who had made an unsuccessful attempt to overthrow the constitution and to place Dom Miguel upon the throne, soon after the death of his father, now renewed their efforts; and the regent, yielding to his own despotic instincts and to the violent clamors of his mother and her fanatical partisans, assumed the sceptre as absolute king, dissolved the constitutional cortes (March 18), defeated the troops of

the garrisons of Oporto and of other places who declared for Dom Pedro and the charter, convened a new cortes (May 8), and having caused all those legislators who were likely to oppose him to be imprisoned or exiled, he was unanimously declared to be the lawful king (June 21). Dom Pedro's claims to the throne were dismissed under the pretext that as Brazilian emperor he must be regarded as a foreigner in Portugal, and Dom Miguel took formal possession of the throne on July 4. He consolidated his power by the most extravagantly despotic system of government. Those implicated in the Oporto insurrection were severely punished, and an expedition was sent against Madeira and the Azores, whose inhabitants had refused to acknowledge him, and the islands were subdued with the exception of that of Terceira. In the mean while Dona Maria was on her way from Brazil to Portugal; but learning at Gibraltar the changed condition of the country, she refrained from landing at Lisbon and sailed for England, where she was received as queen of Portugal. In 1829 she returned to Brazil, to accompany her father, who had abdicated the Brazilian throne in favor of his infant son, to Europe, and to assert with his assistance her claims upon the throne of Portugal. Dom Miguel's administration was constantly becoming more odious to the people, the gallows being almost as frequently employed as the guillotine during the French revolution. The number of persons imprisoned for political offences was estimated in 1830 at 40,000, beside those who had fled and others who had been banished to Africa. Not content with cruelly persecuting and despoiling his countrymen, he extended his outrages to British and French subjects; and although the fleets of these nations and even of the United States appeared in the Tagus and compelled him to redress the acts of violence committed against the respective subjects of those countries, he persisted in his tyrannical policy; and the position of Portugal, thus jeopardized abroad, was aggravated at home by the disastrous condition of the finances. To meet his necessities, he saddled all Portuguese possessions with new burdens. The island of Terceira, however, refused to comply with his demands; and as the population had from the beginning refused to recognize his authority, a regency was installed there with the duke of Palmella at its head, Dom Pedro issuing thence a decree in favor of his daughter, and collecting there an army, which counted in its ranks soldiers of almost every European nation. The island of St. Michael was captured early in 1832, under the command of Villa Flor, one of the members of the regency; and with an expedition consisting of about 10,000 men, which sailed from that island June 27, Dom Pedro appeared before Oporto July 8, taking possession of the town without the loss of a single man (July 23). Dom Pedro found himself, however, for a long time in great difficulties in Oporto, until 1833, when Napier, the English admiral who commanded his fleet, succeeded in utterly

annihilating that of Dom Miguel in the neighborhood of Cape St. Vincent. The army subsequently advanced upon Lisbon, where the population declared unanimously in favor of Dona Maria. Leiria, an important town between Lisbon and Coimbra, capitulated to the queen's troops in Feb. 1834, and other parts of the country declared rapidly for the constitutional sovereign. The cause of Dom Miguel was desperate. He shut himself up at Santarem, expecting assistance from Spain. The troops sent to Portugal from that kingdom, however, were pursuing another pretender, the English and French governments having formed an alliance for the purpose of supporting the cause of both the queens of Portugal and Spain, and the army sent to Portugal in pursuit of the fugitive Don Carlos actually served to strengthen the forces operating against Dom Miguel. Only a miserable fragment of his followers remained attached to his fortunes; the great body of the Miguelites disbanded, and on May 26 a convention was concluded at Evora Monte, and confirmed by his declaration of May 29, by which he formally consented to leave the country. The terms of the convention were that he should depart within a fortnight, and never again set foot either in Portugal or in Spain, nor in any way concur in disturbing those kingdoms; that he should have a pension of about \$75,000, and be permitted to dispose of his personal property after restoring the crown jewels and other articles; and finally, that he should command the troops still adhering to his cause instantly to lay down their arms, and the fortresses to surrender to Dona Maria. On June 1 he embarked at Sines on an English frigate, and landed at Genoa June 25. His first act there was to protest against the convention of Evora, in consequence of which he forfeited his annuity from the Portuguese government. He has since resided at Rome, where he was recognized as the lawful king of Portugal by the papal authorities. He has also spent several years in London, where he lived in humble lodgings, and where he was noted for his debaucheries and associations with intriguers of all nations. In 1851 he married the German princess Adelheid von Löwenstein Wertheim-Rosenberg, by whom he has a son (Miguel, born in 1853) and 4 daughters, the youngest of whom was born in Nov. 1858.

MILAM, a central co. of Texas, bordered N. E. by the Brazos river, intersected by Little river, and drained by its tributaries the San Gabriel, Bushy creek, and others; area, 850 sq. m.; pop. in 1858, 3,476, of whom 1,128 were slaves. The surface is generally rolling, in some places hilly and broken, and the soil mostly fertile. The productions in 1850 were 38,539 bushels of Indian corn, 8,032 of sweet potatoes, 26,808 lbs. of butter, and 675 of wool. In 1859 the value of land was \$375,847. Capital, Cameron.

MILAN (It. *Milano*; Germ. *Mailand*; anc. *Mediolanum*), the principal city of N. Italy, and

capital of Lombardy and of a province of its own name, situated S. of the Alps, in lat. 45° 28' 10" N., long. 9° 11' 30" E., in a fertile plain between the small streams Lambro and Olona, which connect by the Naviglio Grande canal with the Ticino and by the Martesana canal with the Adda, establishing a communication with the Lago Maggiore, the lake of Como, and the Po; distant 176 m. by railway W. from Venice, and 80 m. in a straight line N. E. from Turin; pop. in 1857, 186,685. Raumer the historian says: "Milan stands in a sea of green trees, as Venice stands in a sea of green waters." Unlike other celebrated Italian cities, Milan combines remarkable natural and architectural attractions with appearances of comfort and material prosperity; and it is justly regarded as one of the most pleasant cities of Europe. Its form is nearly circular. The length of the canal which forms the circumference of the most densely populated part of the city is 5 m.; the whole circuit of the modern city is 8 m., and that of the outer wall 10 m., the latter area comprising, beside the city proper and its suburbs, a great number of gardens and orchards. The principal gates of the city are the Porta Comasina, Nuova, Orientale, Tosa, Vigentina, Ludovica, Romana, Ticinese (by which Bonaparte entered after the battle of Marengo), Verzellina (built to receive Napoleon when he came to assume the iron crown), and Tenaglia, which leads to the Simplon. The principal entrance to the city is through the last named gate, by an esplanade called Piazza di Castello, containing the ancient Gothic castle of the Visconti family. The street running all round outside the city is called Strada di Circonvallazione. Many of the streets are narrow and winding, but they are generally well paved, and some of the thoroughfares are admirable. Many streets parallel to and in the immediate vicinity of the canal retain the name of *terrazzi* or terraces. The Piazza de la Fontana is the largest square. The Piazza Borromeo is adorned with a statue of that saint. The Piazza di Castello or esplanade was much embellished by Eugène de Beauharnais during his viceroyalty. On the N. E. side of the castle is the Piazza d'Armi, and opening into it is the *arco della pace*, second only to the *arc de l'étoile* in Paris, a magnificent white marble triumphal arch, principally the work of Cagnola, begun in 1807 and completed in 1838, standing beyond the Duomo d'Ossola, on the Simplon road. The most fashionable promenades are the streets called *corri*, which lead to the principal gates. The corso of the Porta Orientale is the most beautiful and most frequented.—The houses of Milan are generally from 3 to 5 stories high. There are not as many sumptuous mansions as in Genoa, Rome, and Florence, but some of the palaces or *case*, as the Visconti, Belgiojoso, Annone, and Belloni palaces, are fine architectural monuments executed by distinguished artists, and containing many works of art. The archiepiscopal palace, the royal palace (Palazzo della Corte), the Palazzo Marini or of the treas-

ury, the palace of justice, that of the government, the palace of science and art (Brera), the mint, and the famous *monte di stato* or public loan bank, are among the most remarkable public buildings. They are all eclipsed, however, by the cathedral, next to St. Peter's the largest church in Italy. It is situated almost in the centre of the city, in the Piazza del Duomo. It was begun by Visconti in 1386 on so large a scale that it is not yet quite finished, although Napoleon I. gave a powerful impulse to its completion; and though the main design has been carried out, the details present inconsistencies and anachronisms of style. The interior is crowded with monuments of prelates and princes and relics of saints. The cathedral contains 52 piers, about 100 pinnacles, and upward of 4,400 statues. In fretwork, carving, and statuary, it is said to eclipse all other churches in the world. Eustace in his "Classical Tour" says: "Its double aisles, its clustered pillars, its lofty arches, the lustre of its walls, its numberless niches, all filled with marble figures, give it an appearance novel even in Italy, and singularly majestic." (For its dimensions see CATHEDRAL, vol. iv. p. 578. See also Franchetti, *Storia e descrizione del duomo di Milano*, Milan, 1891; and Rupp and Bramati, *Descrizione storico-critica del duomo di Milano*, Milan, 1823, with plates.) One of the other most remarkable churches is that of St. Ambrose, renowned on account of its high antiquity and as the scene of ecclesiastical councils, political conflicts, and the coronation of sovereigns. In the refectory of the ancient Dominican convent, the present church of Santa Maria della Grazie, is the celebrated fresco of the "Last Supper" by Leonardo da Vinci. The church of Santa Maria, near that of San Celso, in the Borgo San Celso, is noted for its beauty. The church of San Carlo Borromeo, opened in 1847, built after a design of Amati, is surmounted by a dome only second in size to the Pantheon and containing a marble group by Marchesi; but the interior has still an unfinished appearance. Milan abounds with charitable institutions, which possess property to the amount of over \$35,000,000. The principal of them is the great hospital, 880 feet in length by 360 feet in depth, founded by Francesco Sforza in the 15th century, open to all applicants, and containing a free dispensary; among other endowments it has received two legacies respectively of \$600,000 and \$1,800,000, bequeathed by private individuals. Among the other hospitals are the large founding hospital; the Trivulzi hospital, founded by a nobleman of that name for the relief of the aged; and the lazaretto, the most extensive of them all, situated outside of the walls, founded in the 15th century for the plague-stricken, and consisting of 4 ranges of buildings, nearly 1,200 feet each in length, and enclosing an area of more than 80 acres.—Education is represented in Milan by the archiepiscopal seminary, 2 lyceums, 8 gymnasiums, and a number of colleges and schools, including one for deaf mutes, one for veterinary surgeons, and

one for the technological sciences. There are an institute of science, a geographical-military institute noted for issuing excellent maps, a collection of zoology and palaeontology in the *museo municipale di storia naturale*, and other establishments and societies for the promotion of science, literature, and art. The intellectual activity of the city has been rapidly increasing since the overthrow of the Austrian rule in 1859, and is particularly evident in the great number of newspapers and periodicals now published there; one of the most able among the latter is *Il politecnico*, edited by the accomplished Carlo Cattaneo. There are now (1860) probably more books published in Milan than in any other city of Italy. The Milanese school of engravers has acquired a high reputation within the last 20 years. The academy of fine arts (of which D'Azeglio, the Sardinian governor of Milan, was appointed president in Aug. 1860) is one of the most celebrated institutions of its kind in Europe, and the *palazzo delle scienze e delle arti*, in which it is situated (commonly called the Brera from having originally been a Jesuit college called Santa Maria in Brera), is one of the chief ornaments of the city. It contains an extensive gallery of paintings, rich in works by Lombard and Bolognese artists; the public library of nearly 190,000 volumes, including the works bequeathed to it by Haller; a number of medals and an archaeological library; a collection of casts; a botanical garden, and an observatory, one of the best in Italy, under the direction of Carlini. Beside several other special libraries in the Brera, Milan is the seat of the world-renowned Ambrosian library, founded by Cardinal Borromeo, and carefully explored by Cardinal Mai, who made there important discoveries of palimpsests. (See AMBROSIAN LIBRARY.) The most extensive private library in Milan is that of the marquis Trivulzi. The theatres and theatrical entertainments at Milan are numerous and excellent. La Scala vies with San Carlo at Naples, being capable of accommodating between 3,000 and 4,000 persons. Its musical audiences are perhaps the most fastidious in the world. Attached to it is an academy of dancing, and it also contains a *sala di ridotto* for concerts and balls. Among the other principal theatres are the Canobbiano, the *teatro ra*, and the *filodrammatico*, conducted exclusively by amateurs, and where Pasta and other distinguished artists first made their début. The amphitheatre, built in Napoleon's time, is capable of containing 30,000 spectators, and is a favorite place for races, fireworks, balloon ascensions, &c. The arena can be filled with water and used for boat races. The city contains fine coffee houses and hotels, elegant shops, and a magnificent bazaar (*galleria di Cristoforo*); and on account of its gay and bustling appearance it has been often called "the little Paris." Milan is the seat of an archbishop, and of the principal civil and military authorities of Lombardy. The fortifications, consisting of a bastioned wall and of some other works, form an

irregular polygon, and are not sufficiently strong to withstand a siege; but the works have been strengthened since 1850. In the inland trade, the commercial activity is greater than that of any other city in Italy. The principal articles of commerce are silk, grain, rice, and cheese. The manufactures of silk goods, ribbons, felt and silk hats, turners' work, cutlery, and porcelain are important.—Ancient Milan or Mediolanum was the chief place of the Insubres in Cisalpine Gaul, and for a long time the capital of that province. It fell into the hands of the Romans about 222 B. C. Under the empire it advanced rapidly in prosperity and in political and intellectual importance, insomuch that it was called the modern Athens and little Rome. It became the central point from which the high roads of N. Italy radiated; its admirable position midway between the Alps and the Padus (Po) made it the natural capital, and it was the actual imperial residence under Maximian and some of his successors, from about the beginning of the 4th till that of the 5th century, when the imperial court was transferred to Ravenna. By his edict issued at Milan (313), Constantine granted tolerance to the Christians. St. Ambrose was upward of 22 years archbishop of Milan, where he died in 397; several of his hymns are still sung in the churches of Milan, and his personal influence made his metropolitan see paramount in the councils of Christendom. In the middle of the 5th century the city was taken and plundered by Attila. It next became the capital of the Gothic kings, and was recovered by Belisarius, but retaken by the Goths (A. D. 539) and almost entirely destroyed and nearly depopulated. In the latter part of that century it was occupied by the Lombards, and in 774 it came into the possession of Charlemagne. A number of his successors assumed either at Milan or at Pavia the iron crown, which is preserved at Monza, near the city. After the coronation of Otto I. at the end of the 10th century Milan formed part of the German empire, and its governors were appointed by the emperors. The city was besieged by Conrad II. in the early part of the 11th century, on account of the attempt of Archbishop Heribert and others against the imperial authority. In the 12th century, when Milan was the most wealthy, populous, and influential city in Lombardy, it became the principal opponent of the German emperors, and was twice besieged by Frederick Barbarossa (from Aug. 6 to Sept. 8, 1158, and again from May 29, 1161, to March 4, 1162); and after the second siege it was almost entirely destroyed. Quickly recovering from the effects of this calamity, it was declared a free city after the victory of the Lombard league at Legnano in 1176; and although pledging itself by the treaty of Constance (1188) to recognize the German emperors as chief feudatories and magistrates, it was permitted to withhold from them for all time the revenues of the immense municipal domains. The efforts of the citizens to liberalize their institutions were thwarted

by the conflict between the Guelphs and Ghibelines, the political influence being divided between the family Della Torre, the representatives of the former, and the Visconti, of the latter party. From 1287 to 1311 the Torre were successful in monopolizing the office of *podestà* or chief magistrate. A rebellion against the emperor Henry VII. brought their rivals the Visconti into power in the latter year. Matteo Visconti and his successors extended the power of Milan over almost all parts of Lombardy, and in 1395 it became the capital of the duchy of Milan. The first duke of Milan was Giovanni Galeazzo Visconti. On the extinction of the male line of the Visconti family (1447) Francesco Sforza, the husband of an illegitimate daughter of the last of the Visconti, secured the duchy for himself and his descendants. The claim of France upon Milan, derived from intermarriage with the Visconti, was taken up by Louis XII. (1499), and more strongly by Francis I., who was opposed by the emperor Charles V.; and the duchy was alternately in the hands of the French and of Sforza until Francis was obliged to relinquish his pretensions by the treaty of Madrid (1526). Francesco Sforza II. having received Milan in fief from Charles V., it reverted to that emperor after the extinction of the male line of the Sforzas (1535); he gave it to his son Philip II., and it remained in the power of Spain for nearly two centuries. From the end of the 14th to that of the 16th century Milan was celebrated for its manufactures of arms and armor; and in 1398 the earl of Derby despatched messengers to Visconti to request a supply of the armor of Milan for his purposed duel with the earl marshal. Milan was equally renowned for the elegance and tastefulness of its finery, and became so noted as a leader of fashions in Europe, that, according to Nares and Johnson, the word milliner meant originally an importer of fashionable articles from Milan. In 1576 the city was desolated by the plague, which gave to the cardinal Borromeo opportunities for the display of his zeal. At the close of the war of succession, the duchy was allotted to Austria (1714), and constituted together with Mantua the Austrian portion of Lombardy. After the invasion of the French in 1796 it became part successively of the Cisalpine republic (1797), of the Italian republic (1802), and of the kingdom of Italy (1805). In 1814 it became a province of Austria and part of the Lombardo-Venetian kingdom. Soon after the French revolution of 1848 Milan became the scene of disturbances; and after the departure of the viceroy, Archduke Reyner, a violent insurrection broke out, in consequence of which Gen. Radetzky, the commander of the citadel, was compelled to evacuate the city, which was occupied by the Piedmontese, and a provisional government was established under the auspices of the latter. After the defeat of Charles Albert at Custoza (July 25) the republicans of Milan came into power and overthrew the provisional government. Soon afterward, however (Aug.

18), the city was compelled to submit to Radetzky, who entered it with 50,000 men and declared it in a state of siege until December. The disturbances of March, 1849, and the rising of Feb. 6, 1853, were speedily suppressed. The rule of Austria was brought to a close in 1859 by the French and Sardinian armies; and the Austrian troops evacuated Milan June 5. Napoleon III. and Victor Emanuel made their entry into the city June 8, and by the peace of Villafranca (July 11) Milan and the rest of Lombardy were ceded by Austria to France, to be transferred by the latter to Sardinia.

MILBURN, **WILLIAM HENBY**, commonly called the blind preacher, an American Methodist clergyman, born in Philadelphia, Sept. 26, 1823, noted for his eloquence in the pulpit and the lecture room. In 1859 he visited England in company with Bishop Simpson and the Rev. Dr. McClintock, and delivered lectures in the principal cities to crowded audiences. His "Ten Years of Preacher Life" was published in 1859, and "The Pioneers and People of the Mississippi Valley" in 1860. For a full sketch of his previous career, see **BLIND**, vol. iii. p. 358.

MILDEW. See **FUNGUS**.

MILE (Lat. *mille passuum*, 1,000 paces of 5 feet each), a measure of length or distance. According to the estimates of the length of the Roman foot, the ancient mile must have been 1,614 or 1,618 English yards, while the English statute mile amounts to 1,760 yards or 5,280 feet. The English geographical mile is $\frac{1}{60}$ of a degree of latitude, or 1.1428 m. The distance expressed by the term mile varies in different European countries. The following are the values in some countries, as given in Kelly's "Cambist":

| | Yards. | Stat. miles. |
|------------------------------|--------|--------------|
| Modern Roman mile..... | 1,623 | 0.925 |
| Irish mile..... | 2,240 | 1.273 |
| French league (3 miles)..... | 4,268 | 2.429 |
| Spanish judicial league..... | 4,685 | 2.684 |
| German short mile..... | 3,509 | 2.297 |
| Spanish common league..... | 7,416 | 4.214 |
| Prussian mile..... | 8,387 | 4.680 |
| Swiss mile..... | 9,158 | 5.201 |
| German long mile..... | 10,126 | 5.758 |
| Swedish mile..... | 11,700 | 6.443 |

MILES, **JAMES WARLEY**, an American scholar, born in Charleston, S. C., about 1819. He was educated at the South Carolina college, took holy orders, and became in early manhood a missionary to the East, where he acquired a knowledge of Hebrew, Turkish, Persian, and other oriental tongues. On his return, he became assistant to the rector of the church of St. Michael's, Charleston, but withdrew from this position to accept the professorship of Greek and history in the Charleston college. His health requiring change of scene, he visited France and Germany, prosecuted his favorite studies of philology and philosophy in Berlin, and on his return after two years' absence became librarian of the Charleston college, his former professorship being still kept vacant for him. He has written graceful and vigorous articles for the "Southern Review," and published an elaborate work entitled "Philosophic

Theology, or Ultimate Grounds of all Religious Belief based on Reason" (Charleston, 1849). He has also written highly esteemed fugitive poems, and has long been engaged upon a work devoted to the highest problems of metaphysics.

MILETUS, an ancient city of Asia Minor, situated in the northern part of Caria, but politically belonging to the Ionian confederacy, of which it was the southernmost member. It stood at the northern extremity of a promontory formed by the Grius range, opposite Priene and the headland of Mycale, and commanding the entrance of the Latmic bay, into which the Mæander flowed. Miletus possessed 4 harbors, protected by a group of islands, the principal of which was Lade. It was divided into an inner and outer town, encircled by a wall, the inner being also called Old Miletus. It is, however, difficult to determine the precise position of the now ruined city, owing to the continued changes produced in the bay and its surroundings by the action of the Mæander, which, bringing down immense masses of soil, has filled up the northern portion of the water basin, and changed Lade and the other islands into parts of the continent. The territory of Miletus extended round the bay as far as the promontory of Mycale on the N. and Cape Posidium on the S. The earliest inhabitants of Miletus were Carians, Leleges, and Cretans, and it derived its historical name from Miletus, a leader of the latter, being also called Pityusa and Anactoria. It was subsequently settled by Ionians from Greece under the lead of Neleus, the younger son of the last Athenian king, Codrus. It was celebrated as an industrial and commercial city, and in the early portion of Grecian history it was the foremost maritime power, extending its commerce and colonies all over the shores of the Mediterranean, the Propontia, and the Euxine. Among its colonies were Naucratis in the delta of Egypt, Sinope in Paphlagonia, Panticapæum in the Taurian peninsula (Crimea), and Odessus, Olbia, Tomi, and Istropolis, on the N. W. shores of the Euxine. At the same period, when culture and arts among the Greeks had their principal seats on the W. coast of Asia Minor, it also occupied a dignified place among the most enlightened cities of Ionia, being the birthplace of the philosophers Thales and Anaximander, and of the historians Cadmus and Hecataeus. It successfully defended its independence against Alyattes and Sadyattes of Lydia, but succumbed to the last monarch of that kingdom, Croesus; and after his fall it was subdued by the army of the Persian conqueror under Harpagus. Under Aristagoras, the brother-in-law of its governor Histæus, it revolted with the other Ionian cities against Darius Hystaspes, receiving aid from the Athenians, but was finally subdued and destroyed by the Persians (494 B. C.), the great revolt leading to the first invasion of Greece. Recovering, however, under the later Persian kings, it vainly defended the cause of the last of them against Alexan-

der (834), and suffered a new ruin. Having belonged for about a century to the Seleucidae, it was annexed to the territories of Rome after the defeat of Antiochus the Great, and shared the fate of the other cities of the province of Asia, dwindling away under the Byzantine rule, until it was totally destroyed by the Turks.

MILFORD. I. A township and village of Worcester co., Mass., on the Milford branch of the Boston and Worcester railroad, 34 m. S. W. from Boston; pop. in 1855, 7,489. In 1859 it contained 6 churches, a bank, and a high school. In 1855 there were 2 machine establishments and several manufactories. The total value of boots and shoes manufactured in 1855 was \$1,789,315. II. A post borough of Kent co., Del., on Mispillion creek, 21 m. S. S. E. from Dover, and 60 m. S. from Wilmington; pop. in 1850, 2,580. It is, next to Wilmington, the largest town in the state, and contains several churches, 2 banks, and a public library. The Mispillion divides it into North and South Milford.

MILFORD HAVEN, a harbor of Pembrokeshire, Wales, and the deepest, safest, and most commodious in Great Britain, formed by an inlet of St. George's channel, N. W. of the entrance to Bristol channel. Its opening is toward the S., but after penetrating a short distance inland it changes its direction and runs E., branching off into numerous bays, creeks, and roads. It is about 10 m. long and from 1 to 2 m. wide. The tides rise from 28 to 80 feet, and at low water it contains as great an area of deep anchorage as the aggregate of Plymouth, Portland, and Holyhead. Lord Nelson pronounced it one of the finest harbors of the world. Of late years great improvements have been made in it, chiefly by the present proprietor of Milford, the Hon. Robert Fulke Greville, who has constructed at his own cost a pier extending 700 feet into the haven. It is designed to make Milford Haven a great port for transatlantic steamers, for which it is thought to possess many advantages over Southampton; and the British government is now constructing a system of fortifications which will render it one of the strongest seaports in the United Kingdom. A royal dockyard was formerly maintained at the small town of Milford on the N. shore of the haven, but has been removed to Pembroke further up the haven. Milford (pop. in 1851, 2,877) is a modern place engaged chiefly in ship building. It has lately been connected by railway with the South Wales line.

MILFORT, **LE OLERC**, a French adventurer, who in his youth came to America, travelled through the British colonies, and finally, about the year 1776, visited the Creek nation. Here he attached himself to the Creek chieftain, Alexander McGillivray, whose sister he married. He was made a war chief by the Indians, and performed active service against the whigs of Georgia during the American revolution. He remained with the Creeks for 20 years. In 1796, having lost his wife and his friend and brother-in-law McGillivray, he returned to

France, and was made a general of brigade by Bonaparte. About the same time he published an interesting memoir of his residence among the Creeks (*Séjour dans la nation Creek*). He married again in France, distinguished himself in 1814 by a gallant defence of his own house, in the city of Rheims, against a party of Russians, and died soon afterward.

MILITARY FRONTIER (Germ. *Militär-Grenze*; Hung. *Határőr-vidék*), a long tract of land, forming the S. border of the Hungarian provinces of Austria, and now constituting a separate crown-land of the empire, situated between lat. 44° and 47° N., and long. 14° and 28° E., and bounded N. by Carniola, Croatia, Slavonia, and the Voivodina and Banat, E. by Transylvania and Wallachia, S. by Servia, Bosnia, and Dalmatia, and W. by the Adriatic; area about 13,000 sq. m.; fixed pop. in 1857, 1,066,272. Its breadth varies, being greatest in the W. part, which is traversed by continuations of the Julian Alps, branches of which are the Great and Little Capella ranges, and by the Dinaric Alps, while the easternmost division is crossed by offshoots of the S. E. Carpathians. The middle parts are mostly level, and exceedingly fertile. The highest elevation is that of Mount Klek or Ogulin Head (Germ. *Oguliner Kopf*) near Zengg on the Adriatic, being about 6,500 feet above the level of the sea. The principal rivers are the Danube, which traverses the country in a S. E. direction between Peterwardein and Semlin, continuing its course E. on the southern frontier as far as Orsova, and receiving the waters of the Theiss, the Bega, and the Temes; the Save, which separates the Military Frontier from Bosnia and Servia, and falls into the Danube between Semlin and the Turkish fortress of Belgrade; and the Kulpa and the Unna, affluents of the Save, flowing respectively on the confines of Croatia and Bosnia. There are some mountain lakes in the W. part, and numerous beautiful valleys in various regions. Of mineral waters, the sulphur springs of Mehadia, near the confines of Wallachia, are most celebrated, the place being also famous for picturesqueness of scenery. The climate is very mild in the level country, but severe in the mountains. The principal productions are the various kinds of grain, maize, tobacco, flax, hemp, fruits, and wine; and of minerals, silver, iron, copper, lead, and some gold. The animal kingdom is also well represented. The inhabitants are mostly of Slavic race, Croats, Slavonians, Serbs, &c.; but there are also Wallachs, Magyars, Germans, Greeks, Jews, Clementines (Albanians), and gypsies. The predominant religions are the Greek and the Roman Catholic, the former having its centre at Carlovitz on the Danube, the seat of a patriarch or archbishop; the Protestants, United Greeks, and Jews together form less than $\frac{1}{10}$ of the population. There are few towns, but some of them, as Peterwardein, Carlovitz, Semlin, Pancsova, and Old Orsova, all on the Danube, Zengg, Carlopago, and Brood, in the western di-

vision, and others, are important on account of their situation. The country, the organization of which is peculiar, is divided into two military commanderies, the seats of which are not in the Military Frontier, but in Agram and Temesvár. One embraces the western or Croatian and middle or Slavonian frontier lands, and the other the eastern or that of the Banat. Almost the whole male population, the frontier peasantry, being bound to do military service, they are divided into 14 regiments and one battalion of boatmen (Tchaikists), each occupying a separate district, the latter that of Titel. All landed estates are the common property of the frontier communities, the rural buildings being partly inalienable, and partly individual property. All male peasants above 20 years of age are bound not only to serve in defence of the country, but also in foreign wars, and they thus form one of the principal military resources of the empire. Arms, accoutrements, and ammunition, as well as other necessities during the service, are supplied by the government. In all military respects the frontier population (beside whom there are numerous families subsisting by trade, commerce, and other branches of industry) are subject to the rules and penal code of the Austrian army, and in all others to the civil laws of the empire, the frontier communities having their own communal organizations.—The origin of the military organization of the country, which was created and gradually developed as a barrier against the Turks, is traced back to the beginning of the 15th century. Numerous bodies of Christian emigrants or refugees from Servia, Bosnia, and other Turkish provinces, served to strengthen it especially during the 16th century; but subsequently, the original aim being dropped, the modern organization was introduced by the Austrian government, under several organic laws, those of 1807 and 1850 being the most important. The frontier peasantry has proved its zealous adherence to the rule of Austria in various wars, especially during that of the Hungarian revolution in 1848-'9. For an account of another similar organization see TRANSYLVANIA.

MILITARY SCHOOLS, institutions in which soldiers are instructed or youths educated for the army. Of the former class, the "soldier schools" of Prussia, established in every regiment or battalion, in which the privates are taught the common rudimentary branches, and sometimes singing also, are the most remarkable. There are similar schools in the Austrian, British, and other European armies. Academies of the second class, intended to educate officers, were not unknown in antiquity, and are now an indispensable part of the military system of all great nations. The first military school in France was established by Louis XV. at Vincennes in 1751; it had 500 pupils, all of whom were young noblemen. The famous school of St. Cyr was founded by Bonaparte in 1803, and still retains the principal features of its first organization. It has 300 pupils between 18 and 20

years of age, who after a course of 2 years are sent, some to the *école d'état-major*, others to the cavalry school at Saumur, and the rest to the army as sub-lieutenants of infantry. Even before the 7 years' war the French had an artillery school in every town where a regiment of that arm was garrisoned, and their example has been followed by Saxony, Austria, and Prussia. In the last named kingdom the education of officers is provided for by high schools for each arm in every army division, and by the royal military school at Berlin, founded by Frederic the Great, to which the most deserving young officers are admitted from the line. In Great Britain the royal military college at Sandhurst, which comprises a cadet's college and a staff college, and the royal military academy at Woolwich, designed as an artillery and engineer school, enjoy a high reputation. A military college was also established by the East India company at Addiscombe for the education of cadets for their own army. The United States military academy at West Point, founded in 1802, ranks second to no institution of the kind in the world. Cadets are admitted on the recommendation of members of congress and the president of the United States, the number being limited to 250. The education and subsistence are gratuitous, which is not the case at Sandhurst, Woolwich, St. Cyr, &c.; but the graduates are expected to spend 8 years in the public service unless sooner excused. The course of study has lately been raised from 4 years to 5.

MILITIA (Lat. *miles*, a soldier), a body of armed citizens trained to military duty, who may be called out in certain cases, but may not be kept on service, like standing armies, in time of peace. It differs from the *levée en masse* in having a regular organization at all times. Something equivalent to a militia seems to have existed in England in the time of the Saxons. The ceorles or peasants held their lands on condition of military service, every 5 hides of ground in most counties being charged with the equipment of one man, and were banded in bodies or companies, the command of which was given to the ealdormen elected by the people in the folk-motes. The peasants were enrolled under the banners of their immediate lords, but in case of rebellion or invasion the state had a paramount claim upon their services, and the lords had no further authority over them than the privilege of leading them in battle. The period of service was limited generally to 40 or 60 days. The organization of this species of militia has been attributed to Alfred, but it seems certain that a national force called the *fyrð*, regulated probably by similar principles, existed before his time. Under the Normans the *fyrð* continued to be maintained simultaneously with the feudal armies, and ultimately became the source both of the modern British militia and of the sheriff's *posse comitatus*. It was not until the reign of Edward III. that a statute was passed providing that no militiaman should be sent out of his

own county except in case of invasion or other grave danger to the realm, nor out of the kingdom in any case. In the 5th year of Henry IV. a law was enacted empowering the king's "commissioners of array" to array and train all men-at-arms, to cause all able-bodied men to arm themselves according to their substance, to amerce those unable to bear arms, and to require the services of persons so armed at the sea shore or elsewhere in season of danger. The command of the militia was often given to the persons charged with these commissions of array, but more frequently it rested with the sheriffs or high constables, each in his own county. Such was the organization of the militia when the parliament of Charles I. in 1642 passed a bill vesting the control of this force, as well as the command of all the forts, castles, and garrisons, in certain commissioners in whom they could confide. The king refused his assent to the bill; and when the parliament thereupon declared the kingdom in danger and issued orders to muster the militia, he issued commissions of array to some of the nobility for the same purpose. Thus began the civil war. After the restoration, the peculiar state of things which had sprung from feudal tenures no longer existed, and the militia was reorganized mainly on its present basis. The king was acknowledged as its sole supreme commander, and no other army was recognized by the law. Lords lieutenant of counties were charged with raising the force, as they had been indeed since the time of Queen Mary; every man who possessed a landed estate of £500 a year, or personal property to the amount of £6,000, was bound to provide, equip, and pay one horseman; every man whose property was $\frac{1}{16}$ of either of those amounts was charged with one pikeman or musketeer; and smaller proprietors united to furnish a soldier, each contributing according to his means. It was not however until 1757, when a bill to reconstruct the militia was passed, that the force acquired much vitality. Amendments have been made from time to time since then; and in 1802 the militias of England and Scotland were consolidated, and that of Ireland offered its services in England in 1804. The militias of Great Britain are now constituted as follows: In each parish lists are prepared every year of all the male inhabitants between the ages of 18 and 85. From these a certain number of men to be enrolled are chosen by ballot, the names of those persons who are exempt being first stricken off. Among the latter are peers, members of other forces, Protestant clergymen, articulated clerks, apprentices, parish schoolmasters, resident members of the universities, seafaring men, any poor man with more than one child born in wedlock in England, any man with more than 2 lawful children and less than £50 of property in Scotland, and any man with more than 3 lawful children who pays less than £5 a year of rent and has less than £10 of property in Ireland. With the consent of a majority of the inhabitants the parish may pro-

cure substitutes for the balloted men by voluntary enlistment, offering a bounty of £6 per man, to be paid by a tax on the inhabitants. The time of service is fixed at 5 years. The command of the militia is vested in the lord lieutenant of the county and the deputies whom he appoints, subject to the royal approval. A property qualification is required of the higher officers, ranging from £200 a year for a captaincy to £600 for a colonelcy. Officers and men receive pay while on active service at the same rate as the regular infantry. The mutiny act and articles of war apply to the militia when called out, except so far as they affect life, and there are special provisions for cases of desertion. By the act of 1854 the sovereign is empowered to call out the militia whenever a state of war exists between her majesty and any foreign power; but the old principle that the militia cannot be compelled to serve out of the realm is still adhered to, and special laws have been thought necessary to enable them to volunteer for foreign service. The sovereign may also call out the militia in cases of invasion, rebellion, or insurrection, or imminent danger thereof, the occasion of doing so being first communicated to parliament, or, if parliament be not in session, declared in council and notified by proclamation. When called out for service, the regiments are said to be embodied; they are occasionally embodied in time of peace, when a whole regiment volunteers to do garrison or other duty. The militia is disembodied when it is only liable to be called out for periodical training and exercise. The expensive and complicated system of the ballot, though still existing by law, has been virtually out of use since 1829, parliament annually suspending its operation, and only the skeleton or staff of each regiment being kept up. When it was found advisable to embody the militia during the late Russian war, the men were raised by voluntary enlistment; and such is now the plan generally pursued, the ballot being retained as a last resort when the voluntary system fails. The Indian mutiny of 1857, and the state of European affairs in 1859-'60, gave fresh occasions for putting the plan into operation. The number of men whom the queen is empowered to raise in this way is 80,000 in England, 10,000 in Scotland, and 80,000 in Ireland. Of late, however, Great Britain has relied for defence mainly upon regiments of volunteers, entirely independent of the militia, subject in peace to the control of the home secretary, and in time of war or public danger to the commander-in-chief. They consist chiefly of the recently organized volunteer rifle corps, with 15,000 yeomanry cavalry. A recent official estimate of the citizen soldiery of Great Britain gives the following figures: embodied militia, 15,911; disembodied militia, 52,899; yeomanry cavalry, 15,002; volunteer rifles and artillery, 122,367; enrolled pensioners, 15,000; total, 221,179. Of these, however, not more than 62,000 have been known to be

under arms at any time, including 18,800 volunteers reviewed at Hyde park in June, 1860, and 20,522 at Edinburgh in August; and it is doubtful how far the above estimate can be trusted. Beside the regular militia, a "supplementary" force may be raised whenever the necessities of the state require it, and in 1808 "local" militias were enrolled in various places for the purpose of replacing corps of volunteers. These bodies may be marched to any part of the kingdom in case of invasion or rebellion.—For militia in France, see *GUARDS, NATIONAL*.—In Prussia a system was founded about the beginning of the present century under the name of the *Waffenpflicht*, that is, the obligation of all to bear arms. The whole nation was bound to rise at the call of the king; and in order to secure efficiency in case of emergency, as great a number as possible of young men were compelled to serve as soldiers for a certain time, and then dismissed to their homes until they were required to fight. At the peace of 1814 this system was modified by the creation of the *Landwehr* ("defence of the country"), which is now the principal military strength of the nation. Every Prussian, with the single exception of mediatised princes, is obliged to serve in the standing army from his 20th to his 24th year, half the time on the reserve. Between the ages of 24 and 35 he belongs to the landwehr of the 1st class, and beside frequent drills is called out for 8 weeks annually to exercise in great manoeuvres. In time of war this corps is joined to the regular army, each regiment having a corresponding regiment in the line with which it forms a brigade. The 2d class of the landwehr is composed of men above 35, and is never called out except in time of war when its services are needed for the defence of the country; it is then required to furnish 12,500 cavalry and about 98,000 infantry. The strength of the 1st class, not including officers, is: infantry, 98,000; cavalry, 16,000; total, 109,000. The Austrian landwehr was organized on similar principles with the Prussian, and recruits for the regular army were frequently drafted from it. In 1809 it amounted to 300,000 men, but of late years the government has relied wholly on forced conscription. The Swiss army consists entirely of militia, and is divided into 3 classes: 1, the regular army, composed of men between 20 and 38 years of age, to the number of 8 per cent. of the population; 2, the reserve, consisting of men between 38 and 40 who have served their time in the regular corps, to the number of 1½ per cent. of the population; 3, the landwehr, comprising all men under 44 years of age who are fit to bear arms and are not serving in either of the other divisions. The strength of the army in March, 1860, was as follows: regular force, about 90,000; reserve, 51,000; landwehr, 43,000; total, 184,000. Probably over 100,000 could be brought into the field at a few days' notice. The organization is very complete, and for celerity of movement and concentration the Swiss army will

compare favorably with any in the world. The Russians have a militia, but there is no general fixed system of enrollment, and in some parts of the empire the whole male population is liable to be summoned to arms. Several militia regiments took part in the Crimean war, and proved very effective soldiers. Spain has a militia of about 550,000 men.—Various other states, such as Sweden and some of the smaller German powers, have also devoted more or less attention to this system of national defence; but it has received its fullest development in the United States of America, where it was established in 1792 by an act of congress providing that all able-bodied white male citizens between the ages of 18 and 45, except officers of government, members of congress, mariners in service, and certain others, shall be enrolled and arranged in brigades, regiments, companies, &c., according to the regulations of the legislatures of the different states. They were to furnish themselves with muskets, ball cartridges, &c., at their own expense, but the general government was to provide ordnance and field artillery. Every division was to have at least one troop of horse and one company of artillery, to be raised by voluntary enlistment from the militia at large. Various alterations have been made in the general law from time to time, but its fundamental provisions, requiring the appearance under arms at specified times of all citizens between certain ages, remain unchanged. In each state, all free, able-bodied, white male citizens of the United States between the ages of 18 and 45, constitute the ununiformed militia of the state. In most states, citizenship in the particular state is also a pre-requisite. In Florida, all persons are liable to be drafted, who have "resided in the same 4 weeks in time of peace, and 10 days in time of war." In Arkansas, this residence in the state is stated at two months. The same time is fixed in Louisiana. In Indiana, all the free, able-bodied male citizens, "except negroes, mulattoes, and Indians," form the militia. In South Carolina, aliens or transient persons, between the ages of 18 and 45, are liable, like citizens of that state, to do all patrol and militia duty which the proper officer may require. The power of regulating the patrol is devolved, by the same act, upon the municipal police of the towns and villages. In Michigan, the governor was specially authorized by the resolve of 1839 to form companies of volunteer militia from the half-breeds and Indians. The enrollment is generally made annually by the assessors of taxes. Many sorts of persons are absolutely exempted from militia duty by statute, and many others are conditionally exempt. The statute provisions vary somewhat, but, taking them all together, we shall find exempted the vice-president of the United States, U. S. officers, judicial and executive, members of congress and of state legislatures while in session, judges and clerks of courts, certain specified state officers, postmasters, mail carriers, custom house

officers, ferrymen, inspectors of exports, superintendents or employees in state hospitals, almshouses, and prisons, keepers of lighthouses, members of fire companies, regular physicians and surgeons, clergymen, faculties and students of colleges and academies, pilots, mariners in service, military or naval officers who have been regularly discharged after a specified service, persons scrupulous of bearing arms, or unable to do so from certified bodily infirmity, idiots, common drunkards, lunatics, vagabonds, paupers, and persons convicted of infamous crimes. Many of the preceding classes, however, are only exempted by the payment of a small annual tax, never over \$5. Many states specially exempt Shakers or Quakers, and in New Hampshire the form of the elder's certificate of membership is given. In New Jersey, minors are exempt in time of peace. In Arkansas and North Carolina public millers, and in North Carolina lock-keepers on the Dismal Swamp, are exempted.—The ununiformed militia are, in general, subject to no military duty whatever, except in case of insurrection, war, invasion, or to prevent invasion. In most parts of the Union, however, it has been found that the periodical trainings, though burdensome to a great majority of the people, are too infrequent to be of much use; while the un-military appearance of the ranks and the absence of music, uniform, accoutrements, and other incidentals which contribute so much to martial éclat, have too generally drawn ridicule upon them. Hence in many of the states, as in England, compulsory enrollment has gradually given place to the volunteer system. The volunteer regiments are limited in some states to a specific number—in Maine, for instance, to 4,000—and are always first to be called into service. Such is the provision in Massachusetts. Usually, each man is required to furnish his personal arms and equipment, while the general armories, ammunitions, ordnance, musicians, &c., are provided by the state, upon the officers giving bonds and securities for proper care of the same. In Ohio, the militia of the state were formerly supplied with arms from the United States. By the bill of rights of this state, "the military shall be in strict subordination to the civil power." The statutes also authorize the governor, who is commander-in-chief, to determine the fashion of the infantry uniform. In Rhode Island the companies of militia are all chartered, and may admit members to the number of 500 each. In Maine no company can be created by the governor of less than 48 men, but in Alabama the colonels commandant have power, by the act of 1835, to form companies in their respective regiments of "a less number than 40 privates," but not less than 80. In Louisiana, the militia in each parish of the state constitute one regiment. Sometimes a provision is found that officers and soldiers once enlisted shall do duty for a term of years, which in New York is 7, unless disability absolutely prevent, or they be discharged regularly. Fines are imposed for

non-appearance on the statute days for military duty, for want of uniform, for deficiency of arms, for disobedience, for parading with loaded muskets, and the like. In New Hampshire a fine of \$2 is imposed on officers "for treating at trainings." A common penalty for non-appearance at trainings is \$2. The statutes often, as in the New England states, provide for the collection of fines by distress, and prescribe a warrant therefor. They also detail the excuses for absence that are valid, and make a surgeon's certificate of sickness important or essential; and they determine the period within which the said excuses are presentable. In 1816 an act was passed in Delaware remitting all military fines for non-attendance on parade days. The statutes furthermore provide, in general, for the pay and rations of the militia, the common sum received by each soldier annually being \$1. In Vermont he is likewise exempted from certain state taxes. Ordinarily neither officers nor soldiers can be arrested on civil process (though they may be on criminal) while going to, or returning from, or performing, any military duty, or any election of officers. Certain aides-de-camp, adjutants, and the brigade inspectors and clerks are allowed a salary by statute. Many of the volunteers are remarkable for precision of drill, general excellence of appointment, and *esprit du corps*, and apparently lack none of the essentials of good soldiers. The governor is always the commander-in-chief in time of peace, but in time of war his functions are different in different states. He appoints his own staff, and issues commissions to all militia officers, who are chosen in various ways. In New York and Massachusetts, captains and lieutenants are elected by the privates of their respective companies, field officers by the company officers, and general officers by the field officers, except the major-general, who is nominated by the governor in New York and by the legislature in Massachusetts. In New Hampshire general and field officers are appointed by the governor and council, and captains and subalterns are nominated by field officers and appointed by the governor. In Vermont, the privates elect their company officers, and the captains and subalterns nominate the field officers, who appoint their staff. In some of the other states the officers or a certain number of them are elected by all the citizens subject to military duty.—In time of rebellion, insurrection, or invasion, the president of the United States has power to call out the militia of such states as he may deem expedient, and to keep them under arms 6 months; but the call must be made through the several governors, who are to judge whether it is justified by the condition of affairs, and may refuse to sanction it if they think proper. In case of riot, the governor may order out the militia to support the laws, and a penalty is laid upon officers and soldiers refusing to obey such orders, but they are usually allowed a compensation when so called out. In Massachusetts, the form of requi-

sition for ordering out troops in case of riot is laid down by statute. In Louisiana, the mayors of towns may demand a detachment of militia in case of "conflagration, or other public exigency," to preserve order and protect property. In North Carolina, three justices may order out the militia to suppress outlawed or runaway negroes. In Connecticut, the captain-general, or, in his absence, the major-general, may on alarm or invasion order out the militia. In Missouri, the military are required to render prompt obedience to the officer summoning them to quell a riot, under penalty of \$50. In Virginia, the term of service of militia called out by state authority is 6 months. In Kentucky, no militiaman is compelled to serve more than 120 days in succession; a tour of duty is estimated at 80 days from the rendezvous. In some states no parade of troops is allowed under severe penalties on days of national, state, or town elections. In New York, no parade of the militia can be ordered, under penalty of \$500, on any day during which a general or special election shall be held, nor within 5 days previous to such election, except in case of insurrection, or invasion, or imminent danger. A similar provision is adopted in Wisconsin. In Maine, all parades are forbidden within 50 rods of a court house while a court is there in session. The statutes generally provide for two or more days of parade and training. In the northern states, one of these is fixed in May or June, "the May training" being familiar to all dwellers in New England. In some of the southern states this spring parade comes rather earlier. Authority is also commonly given by statute for encampments or musters, to be held in the late summer or in autumn. But sufficient warning must be given of encampments, and also of any inspection or training; and a time for suggesting excuses for absence is prescribed, and also the manner in which the sergeant shall make his return of the warning given. In drafts for actual service, the person must appear, procure a substitute, or pay the statute penalty. The militia in actual service are put under the rules provided by the U. S. laws, and the discipline, pay, and rations are those of the regular U. S. troops; but they are always to be led by their own officers. Among the rules imposed by some statutes upon militia in actual service, are, that they shall diligently attend divine service, and behave decently thereat, and shall use nowhere any profane oath or execration, a commissioned officer in Maine paying for each offence 67 cents. If a soldier or officer is killed in service, his family will be relieved by the state. In Maryland, officers and privates disabled in service are entitled to half pay. All the statutes provide for courts martial, and regulate their organization, powers, duties, and limits. It is provided that all officers arrested shall have a copy of their accusations; that all the members of the court shall take an oath, the form of which is usually given; that the records of proceedings shall be

faithfully kept. The votes of two thirds are usually required for a sentence of death; and those accused of crimes punishable by the known laws of the land are generally to be surrendered to the civil authorities. In most states courts of inquiry, for ordinary questions of military discipline, are established. In the district of Columbia, the president of the United States has in general the powers of governors in the states over the militia.—We subjoin a table of the number of the militia in the several states, according to the latest returns received at the office of the adjutant-general of the United States:

| States and Territories. | Date of last return. | No. of Militia. |
|---------------------------|----------------------|-----------------|
| Maine..... | 1856 | 73,558 |
| New Hampshire..... | 1854 | 88,588 |
| Vermont..... | 1843 | 23,915 |
| Massachusetts..... | 1859 | 157,808 |
| Rhode Island..... | 1856 | 14,711 |
| Connecticut..... | 1856 | 51,605 |
| New York..... | 1856 | 287,285 |
| New Jersey..... | 1859 | 51,964 |
| Pennsylvania..... | 1858 | 250,000 |
| Delaware..... | 1857 | 9,229 |
| Maryland..... | 1858 | 46,364 |
| Virginia..... | 1858 | 150,000 |
| North Carolina..... | 1845 | 79,448 |
| South Carolina..... | 1856 | 38,072 |
| Georgia..... | 1859 | 75,099 |
| Florida..... | 1840 | 15,122 |
| Alabama..... | 1851 | 74,623 |
| Mississippi..... | 1858 | 36,064 |
| Louisiana..... | 1859 | 91,224 |
| Texas..... | 1847 | 19,766 |
| Arkansas..... | 1859 | 47,706 |
| Tennessee..... | 1840 | 71,223 |
| Kentucky..... | 1852 | 85,979 |
| Ohio..... | 1856 | 279,809 |
| Michigan..... | 1854 | 97,094 |
| Indiana..... | 1853 | 58,913 |
| Illinois..... | 1855 | 257,430 |
| Missouri..... | 1856 | 118,047 |
| Wisconsin..... | 1855 | 57,231 |
| Minnesota..... | 1859 | 23,973 |
| California..... | 1857 | 207,730 |
| Utah..... | 1858 | 2,821 |
| District of Columbia..... | 1859 | 2,901 |
| Total..... | ..... | 3,070,967 |

There are no returns from Iowa, Oregon, Washington territory, Nebraska, Kansas, or New Mexico; and making allowance for this, and for the fact that many states which are increasing rapidly in population have made no reports for several years, we may safely estimate the militia of the United States at 4,000,000.

MILK, a white fluid secreted in the glands of female mammals, and furnished by them for the nourishment of their young. It contains within itself all the elements required for the sustenance and growth of the human body; and as that of different animals is essentially the same, the milk of many of the larger mammalia, as of the cow, the goat, the camel, the ass, ewe, and mare, has from time immemorial been made use of as an article of human diet. The taste of milk is bland and sweetish; it has a faint odor, an alkaline reaction when pure, and an opacity and whiteness due to myriads of little globules of fatty matter distributed through it (see BUTTER, and CREAM); its specific gravity, which varies according to its composi-

tion and other conditions, ranges in general from 1.025 to 1.081. The globules are of various sizes, and when milk is examined by the microscope they are seen to be quite distinct from the watery fluid in which they are suspended. If the milk is treated with dilute acetic acid, each one of these globules is seen to be included in a very thin investing membrane. They constitute the chief portion of the cream, and according to their abundance give richness to the milk. Being of less specific gravity than the fluid, they rise and gradually collect at the top, forming the layer of cream. When separated, the remaining portion is left of greater specific gravity; and hence it is seen that great density alone is no indication of good quality in milk. If the globules are few and of small size, and the milk does not appear homogeneous, and by the addition of ammonia becomes viscid, it is of poor and may be of unhealthy quality. The fluid portion of milk is water containing dissolved in it caseine or cheese, sugar of milk, and various salts. By causing the proportions of these to vary in a specimen of milk, this is made to undergo a variety of modifications. Thus cream consists of the fatty particles with a small proportion of sugar, caseine, and the other constituents of milk. When removed it leaves behind the skim-milk, containing little fat, but nearly all the cheese, sugar, and salts. Buttermilk, which is the residue after the buttery particles are removed by the process of churning, contains less fat than skim-milk, the buttery particles being mostly brought together in the process of churning by the mechanical action and consolidated in one mass. Both skim-milk and buttermilk, however, are nutritious articles of diet from the amount of nitrogenous matter they contain. Cheese is the caseine precipitated by rennet and compressed in moulds. When made from whole milk, it contains a larger portion of the buttery particles than when made from skim-milk. Before the curdy precipitate is separated, the mixture is known as curds and whey; the former is the mixed caseine and butter, and the latter, called also the *serum*, consists of the water of the milk, the sugar, and the salts. When the fluid portion is partially pressed out, the remainder is cream cheese.—In comparing together milk of the same animal under different conditions of age, health, food, length of time after parturition, &c., as remarkable differences in the proportions of the ingredients will be observed as when samples of the average milk of a number of different species of mammalia are compared. The following table exhibits the composition of several kinds of milk, the first column presenting the average result of 10 analyses by Prof. Poggiale, the next 4 being furnished by Messrs. Henri and Chevalier in the *Journal de pharmacie*, vol. xxv., and the last by Dr. Samuel R. Percy of New York, as the composition of the milk of a healthy woman. The albumen in these analyses is reckoned with the caseine.

| Constituents. | Cow. | Ass. | Goat. | Kve. | Woman. | Woman. |
|--------------------|--------|--------|--------|--------|--------|--------|
| Water..... | 86.28 | 91.65 | 86.80 | 85.62 | 87.98 | 89.20 |
| Butter..... | 4.38 | 0.11 | 3.33 | 4.20 | 8.55 | 2.60 |
| Sugar of milk..... | 5.27 | 6.06 | 5.38 | 5.00 | 6.50 | 6.00 |
| Caseine..... | 3.80 | 1.59 | 4.02 | 4.50 | 1.52 | 2.00 |
| Various salts..... | 0.27 | 0.34 | 0.59 | 0.68 | 0.45 | 0.20 |
| Total..... | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

Of these constituents the most uniform in its proportions is the sugar, but this may be materially increased by the use of saccharine food, as is found in feeding cows upon carrots and beets. The sugar of milk is crystallizable, but it is less sweet and less soluble in water than cane sugar. The butter is composed of a solid and liquid fats and glycerine. Its proportion is very variable. (See BUTTER.) When milk is decomposed, lactic acid is generated, which combines with some of the bases of the salts. As these exist in the ashes obtained from cow's milk, they are thus enumerated by Schwartz in the order of their relative proportions: phosphate of lime, chloride of potassium, phosphate of soda, phosphate of magnesia, soda (combined in the milk with lactic acid), phosphate of iron. Simple methods of separating the constituents of milk are given in many of the works on organic chemistry. MM. Vernois and Bequerel adopted the following mode in their analyses of the milk of the principal breeds of cows, mares, sheep, and the Hungarian buffalo, present at the exhibition of 1856 at Paris; a report of which examination was published in the *Annales d'hygiène publique*, vol. vii., 11th series, p. 271. See also the same work for further memoirs on this subject, vol. xlv., 1st series, 1858, p. 257, and vol. iv., p. 48. The milk to be analyzed is divided into 8 portions. The first of these is evaporated to dryness by being left in a warm oven 24 hours protected from the air. The residue gives the solid parts, the loss the water. From the solid parts the butter is taken up by ether, and being separated by filtering, the loss of weight represents the quantity of butter, or this is obtained directly by evaporating the ether from the filtrate and weighing the residue. The solid parts, being burned in a platinum capsule, give the weight of the salts by incineration. To the second portion a few drops of acetic acid and a little rennet are added, and the liquid is boiled. It coagulates, the albumen and caseine separating from the serum, which contains the sugar and some soluble salts. After filtering, a little acetate of lead is added to the serum, which causes the precipitation of part of the extractive matters; and the liquid is then introduced into an instrument called the polarimeter, by which the quantity of sugar in the solution is determined by the deviation of the plane of polarization. According to the authors the result may be depended upon as mathematically exact. The third portion is employed to give the proportion of albumen. It is left to coagulate naturally for 24 hours, and is then gently shaken, so as to mix the parts uniformly, and filtered. Caseine remains in the filter, and albumen, sugar, and

the salts pass through. Any caseine that escaped coagulation may be made to separate by adding a little rennet to the serum. The albumen is then made to precipitate either by ebullition or the addition of alcohol, and after being separated and dried is weighed. The weight of the caseine and extractives is calculated by deducting from the total weight of the solid parts the sum of those already obtained for the butter, sugar, salts by incineration, and the albumen. Other methods less exact than this are given in Dr. Hassall's "Adulterations Detected." The quantity of sugar may be approximately ascertained by evaporating the whey to dryness, weighing the residue, and deducting the weight of the ash left in its incineration. Milk from unhealthy animals often exhibits an increased proportion of phosphate of lime in the ash. When milk is exposed to a warm temperature it ferments, and lactic acid is generated, which has the same ultimate composition as sugar of milk. Under certain conditions the vinous fermentation may now take place, the sugar of milk be converted into grape sugar, and a spirituous liquor be produced, as is practised by the Tartars. (See KOUSSIS.) Various circumstances affect the quality and composition of milk. That called colostrum, given by the cow immediately after calving, is yellowish, thick, and stringy; for several days it is unfit for use. Examined by the microscope, it is seen to contain numerous corpuscles of large size and granular appearance. Milk drawn from the cow in the morning is thought to be of better quality than that of the afternoon; and a remarkable difference is perceived in the proportion of cream in the first and last portions of the milking, the latter containing twice as much cream as the same quantity of milk of the former. In the udder of the cow the cream seems to rise as it does when the milk is collected in a vessel, and that last drawn thus brings with it the most cream.—MM. Vernois and Becquerel in their researches, before referred to, found a great difference in the character of the milk of cows from different regions, some being especially suitable for butter and other for cheese. The quantity of food furnished to cows seemed to have a notable influence upon the quantity of milk, and especially upon the production of sugar and caseine; while a moderate supply of food seemed to be more favorable for the production of butter and albumen. The milk of the goat was peculiar in containing a very large proportion of albumen, averaging 18 parts in 1,000, the nearest approach to which was the milk of Durham cows, which contained 11 parts in 1,000, and others various lower proportions down to 8 parts in the milk of Swiss cows. The milk of the buffalo of Hungary was also peculiar in this respect, and also for its large proportion of butter qualities, which induced them to recommend the introduction of the breed into France. The milk gave the following quantities in 1,000 parts: water 806.40; soluble parts 193.60, viz.:

sugar 45.18, butter 84.50, caseine 42.47, albumen 18.00, salts 8.45. The largest proportion of butter obtained was from the Angus breed of cows, which gave 98.80 parts in 1,000; and of caseine from the cows of Paris, which gave 55.15 parts, including in this about 4 parts of albumen.—Some of the methods of testing the quality of milk are noticed under GALACTOMETER. By this the specific gravity is ascertained both of the whole milk and skimmed milk; but as these data are of little value without a knowledge of the proportion of cream, another instrument, invented by Sir Joseph Banks, and called the lactometer, is used in connection with the galactometer. It is a tube about $\frac{1}{2}$ inch in diameter, and 10 inches of its length graduated in tenths of an inch. When filled with milk, the tube is set aside for 12 hours for the cream to rise. The proportion of this is then read off in the number of divisions occupied by the upper stratum. The thickness of this stratum is very variable with different sorts of genuine milk; but its general range is from 9 to 14 of the divisions, indicating as many percentages. Dr. Hassall thinks the average of pure milk does not exceed 9 $\frac{1}{4}$ of cream. Dr. Normandy rates it at 8 to 8 $\frac{1}{2}$. A writer upon this subject in Boston, Mass., estimates that the milk delivered there by honest milk dealers will rarely yield over 8 per cent. of cream; while in Baltimore, where he received it in his own cans, brought only 4 miles and upon a light spring wagon, the proportion of cream was often 14 per cent., and never below 10. When carried far by railroad or in wagons without springs, a portion of the cream is apt to be converted into butter and sink to the bottom of the cans, from which it is not taken out in the ordinary manner of supplying customers. The proportion of cream is also determined by an instrument, invented by M. Donné of Paris, called the lactoscope, the principle of which is based upon the opacity of the fluid caused by the buttery particles. A few drops of the milk are introduced between two plates of glass, so set in an ocular tube, that they can be brought close together or separated by means of a graduated screw, and thus enclose at their base a thinner or thicker stratum of milk. The observer then looks through the tube at a light set 8 feet off, and gradually separates the plates of glass, increasing the depth of the layer of milk, till this at last becomes so opaque that the light is lost to view. The figure to which an index on the instrument then points refers to a table, upon which the corresponding quality of the milk as to quantity of cream is designated. The lactometer and lactoscope determine only this one point, and if alone depended upon might lead to very erroneous conclusions as to the general quality of milk. The normal proportion of cream might, for instance, be found in milk to which a considerable quantity of water had been added; and to determine the presence of this it would be necessary to take also the specific

gravity of the skimmed milk.—Of all articles of food used by man, milk is the most important. In his infancy it is his sole support, and in after life it is employed in a variety of forms for his daily nourishment. It is well understood that the health of the child is materially influenced by that of the parent or nurse who supplies this food; and all thoughtful and intelligent parents are scrupulously careful to procure it from pure and wholesome sources. Even the quality of the food of the nurse is an object of solicitude; and when the milk of the cow is substituted for the natural food, care is taken that it should be from a healthy animal, and even from the same one for the same child. But such precautions unfortunately are beyond the reach of the multitudes of the poor, of large cities especially; and their offspring are too often supported by the milk of sickly mothers, or unwholesome milk furnished by the dealers. By reason of its complex composition milk can be tampered with in a great variety of ways, and cheap materials can be substituted for the natural ingredients, seriously affecting its quality, while the fraud can be detected only by the skilful examination of the chemist. The nourishing cream is removed

and water is substituted. This involves the addition of white thickening substances to disguise the cheat, and of other strange ingredients to restore or retain the sweetness and saltness of the milk. Large cities are almost hopelessly exposed to these frauds; but worse than all, a large portion of the milk with which they are supplied is that of diseased cows kept in crowded stables and fed with cheap unwholesome food. The evil has become so serious, that in New York the attention of medical men has been long directed to the subject; and in 1859 a careful investigation was made into the character and properties of the milk of cows fed upon the swill of distilleries, the results of which were embodied in a report of S. R. Percy, M.D., and published in the "Transactions of the New York Academy of Medicine," vol. ii. part iv. In this are presented representations of various sorts of milk, as they appear highly magnified. From these it is evident that the microscope in skilful hands may be depended upon to afford excellent indications of the comparative qualities of milk. But other tests also were employed, and numerous careful analyses were made of the various sorts of milk, many of which are given in the following table:

| Constituents. | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. |
|---------------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Water..... | 85.96 | 85.86 | 85.6 | 86.0 | 82.9 | 87.0 | 92.4 | 98.0 | 86.7 | 92.8 | 87.7 | 86.9 | 87.8 | 49.0 | 88.4 | 49.4 |
| Butter..... | 4.40 | 4.42 | 4.7 | 4.7 | 7.2 | 8.5 | 1.9 | 1.8 | 8.4 | 2.0 | 1.9 | 4.0 | 12.4 | 42.4 | 56.8 | 31.1 |
| Sugar..... | 3.97 | 1.79 | 4.8 | 4.6 | 4.7 | 1.5 | 1.0 | .8 | 1.8 | 1.0 | 1.8 | 4.9 | 15.7 | 2.8 | 2.8 | 1.9 |
| Caseine..... | 5.71 | 1.08 | 4.8 | 4.1 | 4.7 | 6.8 | 8.6 | 8.4 | 6.9 | 8.7 | 7.4 | 4.4 | 13.1 | 4.2 | 2.8 | 16.5 |
| Salts..... | 0.66 | 0.85 | 0.6 | 0.6 | 0.5 | 1.2 | 1.1 | 1.0 | 1.2 | 1.0 | 1.7 | 0.5 | 1.0 | 0.6 | 0.9 | 1.1 |
| Total..... | 100.00 | 100.00 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

No. 1 is the milk of a cow kept for family use in New York; No. 2, of swill-fed cows from distillery stables in New York; both the analyses are by Dr. Doremus. The following are by Dr. Percy: No. 3, country milk furnished by a dealer to customers in New York; No. 4, the same by another dealer; No. 5, milk from Farmington, Conn., a mixture of that of 6 cows; No. 6, milk as drawn from the cows in Williamsburg distillery stable; No. 7, sample of same delivered to customers; No. 8, another sample of the same as sold to customers; No. 9, milk as drawn from the cows in one of the New York distillery stables; No. 10, milk from the same source as delivered to customers; No. 11, milk from a sick cow, Williamsburg distillery stables; No. 12, sample of the milk used by Gail Borden for preparing the "condensed milk;" No. 13, condensed milk as prepared from No. 12; No. 14, cream from the same milk (No. 12); No. 15, cream from No. 5; No. 16, cream from milk of distillery cows at Brooklyn. Healthy milk was observed by Dr. Percy to have an alkaline reaction, while that of diseased animals was always acid. The same observation had been made by Gay-Lussac, Berzelius, and others; and the effect is found to be induced in a short time in animals shut out from the light of day, and in those confined in bad air and supplied with bad food. In this table the bad milk is at once recognized

by its unduly large proportion of caseine, while the sugar and often the butter is as disproportionately small. The large amount of saline matter found in the bad milk is caused by the addition of salt made for the purpose of disguising the adulteration with water. But the proportions of the ingredients, though sufficient to expose the character of the milk, cannot indicate the poisonous qualities of the worst sorts, nor the evil effects that may follow their use. In organic compounds, such as we use for food, as in the air we breathe, the most dangerous poisons may lie concealed beyond the power of detection of the most delicate tests or the most powerful microscopes, and their existence is brought to light only by their effects upon the human system. Thus the real nature of the distillery milk is most properly shown in the report by citation of several cases of disease in young children traced directly to its use.—The preservation of milk from putrefaction is an object of no little importance, and several processes have been devised for this purpose. In France this is accomplished by causing the solid portion of the milk to combine with other matters, and thus separate in a solid form from the aqueous portion; but the compound is not properly milk. It is also evaporated down to the consistency of sirup, and then by the addition of sugar made into a solid compound of milk and sugar; and by a third method it is pre-

served by expelling the air from it, and hermetically sealing the bottles while they are under a steam heat of about 100°C . In this way milk has been preserved perfectly fresh for $5\frac{1}{2}$ years. In the United States a patent was granted in 1856 to Gail Borden, jr., for another method, which he has since successfully conducted in Litchfield co., Conn., supplying what is called "condensed milk" to many consumers in New York. By his process the milk when drawn from the cow is immediately cooled in order to check its changing. It is soon after rapidly heated to 170° to 190°F , and is then removed to vacuum pans in which evaporation of the water is effected at a temperature not exceeding 180° . When sufficiently concentrated, the pans are quickly cooled down by passing cold water in the place of steam through the heating pipes. The milk, converted into a paste, can then be removed from the pans without adhering to their sides. The milk is thus concentrated to a greatly reduced bulk, which by the samples examined by Dr. Percy would appear to be about $\frac{1}{2}$ the original quantity, the loss being water only. This can afterward be restored, and the milk will then regain its original character. Thus prepared, the paste is in a convenient form for transportation, and is not liable to change so quickly as when in its natural condition. It can be kept in ice for some weeks without undergoing change, and in hermetically sealed cans much longer. Another preparation, known as "solidified milk," is also made for the New York market by a process like one of the French methods above referred to. To 112 lbs. of fresh milk 28 lbs. of sugar are added, together with a teaspoonful of bicarbonate of soda, merely enough to neutralize any slight acidity there might be in the milk. The mixture is then evaporated by the heat of a water bath carefully regulated, and the process is hastened by a current of air made to pass over the surface. An apparatus is kept in operation gently stirring the mixture during the evaporating process, until at last the milk and sugar are reduced to a creamy-looking powder. This when cooled in the air is weighed out into pound parcels, and compressed by machinery into the shape and size of small bricks. These, covered with tin foil, are ready for sale, and are well adapted either for preservation during long voyages or for immediate domestic use.—**MILK, SUGAR OF, or LACTINE**, one of the constituents of milk, is prepared in Switzerland as an article of food, and is imported into this country to be used by homœopaths as the vehicle for their medicines, and in other practice as an article of food for infants in teething, being less apt to produce acidity than cane sugar. It is also recommended as a non-nitrogenous article of diet in pulmonary diseases. It is prepared from the whey obtained from milk coagulated with a little dilute sulphuric acid, and left several weeks in a cool place to crystallize. The crystals of sugar of milk are collected and decolorized by animal charcoal and repeated crystallizations. They

consist of $\text{C}_{12}\text{H}_{22}\text{O}_{11} + 5\text{HO}$. They are hard and gritty, rather insoluble in water and alcohol, slightly sweet, and not easily fermentable. When converted into grape sugar by the action of dilute acids, sugar of milk may furnish a spirituous liquor, as noticed in **MILK**. By the homœopaths sugar of milk is regarded as the most inert substance upon the system, and for this reason as well as on account of its great hardness, which causes it to reduce to extreme fineness the substances with which it is ground, they esteem it as the best medium for their medicines, and are by far the largest consumers of it.

MILKY WAY. See **GALAXY**.

MILL. I. JAMES, a British metaphysician and political economist, born at Logie-Pert, near Montrose, Forfarshire, April 6, 1778, died in Kensington, June 28, 1836. Of humble birth, he received his early education at the grammar school of Montrose, whence he was sent by Sir John Stuart to the university of Edinburgh to study for the church. He excelled especially in Greek and metaphysics, listening with deep interest to the lectures of Dugald Stewart, though he afterward departed widely from his system; was for a time private tutor, and was licensed to preach in 1798, but abandoned the profession, and in 1800 removed to London. He became editor of the "Literary Journal," which was soon discontinued, and was afterward an occasional contributor to the principal British reviews. He soon attracted the notice of Jeremy Bentham, was for several years domesticated in his house, and was the chief expositor of his opinions in England. Upon the first establishment of the "Westminster Review" by Bentham, Mr. Mill was the editor and principal contributor. For 10 years much of his time was occupied in writing his "History of British India" (3 vols. 4to., London, 1818; continued to 1835 by Prof. H. Wilson, 9 vols. 8vo., London, 1840-'46), the first complete work, and, as it has been termed, the beginning of sound thinking, on the subject. It was without a rival as a source of information, and the justice of its views appeared in the subsequent measures for the government of that country. Though he had censured the conduct of the East India company, his ability and familiarity with its affairs caused the directors in 1819 to introduce him into their home establishment, where he managed their correspondence with India in the revenue branch of the administration. He subsequently became head of the department of Indian correspondence, one of the most responsible and authoritative positions in the executive service of the company, and lived to see the great principles which he had advocated practically recognized in the government of India. His official duties did not preclude the continuance of his labors as an author, and he became a contributor to the supplement to the earlier editions of the "Encyclopædia Britannica." The articles furnished by him on colonies, education, government, jurisprudence, law of nations, liberty of the press, and prison

discipline were subsequently collected in a volume (London, 1828), and are among his most effective writings. They were reviewed in the 97th number of the "Edinburgh Review" by Macaulay, who, after styling Mill by far the most distinguished of the utilitarian philosophers after Bentham, pronounced him "an Aristotelian of the 15th century, born out of due season. We have here an elaborate treatise on government, from which, but for two or three passing allusions, it would not appear that the author was aware that any governments actually existed among men. Certain propensities of human nature are assumed; and from these premises the whole science of politics is synthetically deduced. We can hardly persuade ourselves that we are not reading a book written before the time of Bacon and Galileo." The work was esteemed by those who accepted its principles as a masterpiece of demonstration. His "Elements of Political Economy" (1821-'2) presented the views of Ricardo in a precise and clear style. His most elaborate work was his "Analysis of the Phenomena of the Human Mind" (1829), an ingenious exposition of the sensational philosophy. The 8 simple elements of consciousness are sensations, ideas, and the train of ideas. By sensation he understands that which exists when the object of sense is present; by ideas, that which exists after the object of sense has ceased to be present; and the train of ideas is only another name for imagination, though he applies the latter term specifically to the train of the poet. From this simple basis he builds up with remarkable subtlety and dexterity a comprehensive system, all the errors or defects of which lie at the very threshold. His conclusions are inevitable if his premises, his representation of the facts of consciousness, be accepted. Sensation, ideation, association, and naming are the elementary processes in his analysis, by which he accounts for all the complex phenomena of the mind, for abstraction, memory, judgment, ratiocination, belief, and the power of motives. By the law of association, which holds a prominent place in the system, he means that ideas recur in the order of the former sensations of which they are the copies. The last publication of Mill was a fragment containing a severe criticism on Sir James Mackintosh's dissertation on the progress of ethical philosophy (1835). He also contributed important articles to the early numbers of the "Westminster Review," on the "Formation of Opinions," the "Ballot," "Aristocracy," and other subjects. II. JOHN STUART, son of the preceding, an English philosopher, born in 1806. He was educated under his father's care, and for many years subjected himself to the severest intellectual training, while pursuing a wide range of studies. His holidays and vacations only diverted without suspending his researches, and his name first occurs in the "British Flora" as an authority for the habitat of flowers. In 1828 he became a clerk in the India house, in which after a se-

ries of promotions he received in 1856 the appointment of examiner of the Indian correspondence, which had been previously held by his father. So thorough was his culture, that the most elaborated mind of our age, as his has been called, seemed almost mature and complete at its first appearance. With reputation for scholarship and ability, he was early regarded by a portion of the disciples of Bentham, prominent among whom was his father, as a writer whose Platonic studies and sympathies were to give a nobler interpretation to the doctrines of the school. He was selected to edit Bentham's "Rationale of Juridical Evidence" (1827), to which he added notes and supplementary chapters. He was a frequent contributor to the journals in favor of advanced liberal views during the agitation of the reform bill. In the "London and Westminster Review," which he conducted from 1835 to 1840, appeared his masterly articles on Bentham and Coleridge, in which his aim was to interpret between their respective admirers, criticizing his own party and reporting truths which it might learn from its opponents. He also wrote for the "Edinburgh Review" and other leading periodicals. He first became widely known by the publication of his "System of Logic, Ratiocinative and Inductive" (2 vols., London, 1843), in which the whole character of his philosophy appears. The predominance which he gives to sensation in psychology involves the predominance of induction in logic. He denies the existence of *a priori* truths, affirms that knowledge is limited to phenomena, and ignores causation beyond phenomenal conditions. He conceives of logic only as an organon, method, or body of rules for showing the coexistence and succession of phenomena, and thereby discovering laws; and according to this definition his work is an almost exhaustive manual of procedure in the present state of the science. But it deals only with secondary truths, deems it illegitimate to attempt to pass from the description to the ultimate rationale of our intellectual processes, and regards ethics, politics, and the exact and physical sciences in the same light and by the same method. This fundamental characteristic makes him reduce the inductive method to a strict system, and introduce peculiar views of the grounds of deductive reasoning. His "Essays on some Unsettled Questions of Political Economy" (1844) was preliminary to his second great work, entitled "Principles of Political Economy, with some of their Applications to Social Philosophy" (1848), a subject peculiarly fitted to his adroitness in the treatment of positive problems and palpable interests. He aimed, like Adam Smith, to associate the exposition of general principles with their practical applications, and also to introduce the new ideas, especially respecting currency, foreign trade, and colonization, which had been elicited by discussions subsequent to the publication of the "Wealth of Nations;" to maintain a course of strict scientific reasoning while exhibiting

the economical phenomena of society in their relation to the best social ideas of the present time. His various "Dissertations and Discussions, Political, Philosophical, and Historical," have been collected, chiefly from the "Edinburgh" and "Westminster" reviews (2 vols., London, 1859), and embrace his views on the most important topics. He maintains that scientific certainty is but a relative certainty, and that theology can have no firmer basis than an inference from the analogies of experience; that morality is but a means to an end, that that end is happiness, that approximation to an ideal standard of inward harmony is the method of attaining that end, that the realization of this harmony is not a moral but an æsthetical achievement, and that the utilitarian is entirely different from the selfish view of life; that poetry, music, painting, and sculpture have great social value and educative power; that political questions should be decided by the deliberately formed opinions of a select few, specially educated for the task, whose rectitude of purpose should be secured by rendering them responsible to the many; that the ideal of a rational democracy is not that the people themselves govern, but that they have security for good government; that there is no essential difference between the powers of woman and man, and that she should be his partner in all actual and intellectual enterprises, and in all social and political privileges and responsibilities; and that all history is a progressive chain of causes and effects, the complex facts of each generation being caused by that which preceded it, and moulding that which follows it. He published also in 1859 a work "On Liberty," the object of which is to show that our age manifests an increasing despotism of social and political masses over the moral and intellectual freedom of individuals, that the supremacy of public opinion discourages the strength or intensity of any well marked type of character, that energetic characters on any large scale are becoming merely traditional, and that the only guaranty against the decline of our civilization is to erect by common consent every individual human mind into an impregnable and independent fortress, within which no social authority shall have any jurisdiction. "A state of things, in which a large portion of the active and inquiring intellects find it advisable to keep the genuine principles and grounds of their convictions within their own breasts, and attempt, in what they address to the public, to fit as much as they can of their own conclusions to premises which they have internally renounced, cannot send forth the open, fearless characters, and logical, consistent intellects, who once adorned the thinking world." A Chinese similarity and mediocrity is becoming prevalent, to resist which he maintains that society has no right to intimidate, even by the combined expression of moral opinion, those whose practice evinces a great divergence of moral principle from the ac-

cepted standard, so long as the practice at issue has no bearing on the rights of any other than the offending persons. In his "Thoughts on Parliamentary Reform" (1859) he recommends the extension of the electoral suffrage to all householders without distinction of sex, on condition of proving their ability to read, write, and calculate, and a considerable extension to persons of certain educational qualifications; advocates the permission of 1, 2, or 3 votes to a single elector; and opposes the use of the ballot, on the ground that a universal moral sentiment condemns concealment.

MILL, JOHN, an English biblical scholar, born at Shapp, Westmoreland co., about 1645, died at Oxford, June 28, 1707. He was graduated at Oxford in 1669, where, after receiving various ecclesiastical preferments, he was made in 1685 principal of St. Edmund's hall. His most important work is his edition of the Greek Testament, to the preparation of which he devoted the last 30 years of his life. It was originally undertaken by him at the suggestion and expense of Dr. Fell, bishop of Oxford; but after that dignitary's death, he continued it at his own cost, and paid back to Fell's executors the money advanced by the bishop. Its publication was completed but a short time before his death. This edition, which adopts the received text of Robert Stephens, contains over 80,000 various readings collected from the works of former commentators, the writings of the fathers, and ancient uncollated MSS.

MILLAIS, JOHN EVERETT, an English painter, born in Southampton, June 8, 1829. His taste for art was developed in childhood, and at 9 years of age he gained a medal from the society of arts. About this time, by the advice of Sir Martin Archer Shee, the president of the royal academy, he was placed in Mr. Sass's preparatory school of art in London, whence at the age of 11 he was transferred to the antique school of the royal academy. In 1848 he gained the medal for drawing from the antique. Three years later he exhibited his first picture at the academy, "Pizarro seizing the Inca of Peru," and in the succeeding year obtained the gold medal for the best oil picture, his subject being "The Tribe of Benjamin seizing the Daughters of Shiloh." It was at this period of his life that, partly through the influence of his brother artists, William Holman Hunt and Dante Gabriel Rossetti, partly through his own original views of art, he was induced to reject the academic rules which had been his previous routine, and to adopt the principles of the so called "Pre-Raphaelite school," of which he was one of the original members. The first picture painted by him in the new style was "Isabella," from Keats's poem, exhibited in 1849. In 1850 appeared his "Ferdinand lured by Ariel," and a mystical picture of our Saviour, and in the succeeding year "Mariana in the Moated Grange," the "Return of the Dove to the Ark," and the "Woodman's Daughter." So rigorously did he follow the realistic principles involved in his

new conceptions of art, that the simplicity at which he aimed was decried as an evidence of baldness and poverty, and his pictures were declared to be utterly deficient in the sense of beauty. Their unquestioned power, however, challenged the attention of those who were most hostile to the pre-Raphaelites, and it was conceded that the naturalism which the artist sought to embody in his works was of a higher order than the literal reproduction of nature. His efforts at religious symbolism found few admirers, and were not subsequently repeated. The "Huguenot" and "Ophelia," exhibited in 1852, increased his reputation; and in the succeeding year his "Proscribed Royalist" and "Order of Release," both evincing matured powers of invention and execution, were very generally popular. The latter picture, which tells its own story, is well known through the excellent and widely disseminated engraving by Cousins. In the same year Millais was elected an associate of the royal academy. His remaining works are characteristic though unequal performances, the pre-Raphaelite principle being occasionally somewhat relaxed in the handling and color, as well as in the arrangement of accessories. The principal are the "Rescue," "Autumn Leaves," *L'Enfant du Régiment*, "A Dream of the Past," the "Blind Girl," "The Escape of the Heretic," "Junketing in an Orchard," &c. Some of these works have been severely criticized by Ruskin and others, and by many of his professed admirers the artist is conceived to have reached the limit of his inventive powers. In popular estimation, however, he still stands at the head of his school. He was at one time a contributor to the "Germ," a short-lived periodical, devoted to an exposition of the views of the pre-Raphaelites, and also competed unsuccessfully for the prize offered at the Burns centennial festival for the best verses in honor of the poet. He has sometimes been engaged in the illustration of books and periodicals. Several years ago he was married to the former wife of John Ruskin, who had procured in Scotland a divorce from her husband.

MILLARD, a W. co. of Utah, extending from the Wahsatch mountains westward for about 400 m., with an equal width of about 60 m.; area estimated at 2,400 sq. m.; pop. in 1858, 804. Carson and Walker's lakes are on the W. border, and Sevier river drains the E. portion. Several ranges of mountains traverse the county toward the W. Capital, Fillmore City, which is also the capital of the state.

MILLARD, DAVID, an American clergyman of the Christian denomination, born in Ballston, N. Y., Nov. 24, 1794. His father, Nathaniel Millard, served as a soldier during the latter portion of the revolutionary struggle, after which he became a farmer, and the son was brought up to active labor on a farm. His school opportunities never exceeded 8 months in each year, after he became able to use any kind of farming implement; but when only 17 years of age he was qualified to teach a common

school. In 1815 he entered the work of the ministry, and in 1818 settled as a pastor in West Bloomfield, N. Y., where he resided 14 years. During that time he wrote and published "The True Messiah in Scripture Light." He also edited for several years a monthly magazine called the "Gospel Luminary." In 1837 he accepted a call to Portsmouth, N. H., where he remained 8 years. In 1841, owing to failing health, he visited the Mediterranean and the East, and in 1848 published a volume of his "Travels in Egypt, Arabia Petrea, and the Holy Land." For several years he has been a professor in the Meadville theological school, Penn.

MILLEDGE, JOHN, an American soldier and statesman, born in Savannah, Ga., in 1757, died at the Sandhills, near Augusta, Feb. 9, 1818. At the commencement of the revolution he espoused the cause of the colonies, and was one of the party which, headed by Joseph Habersham, entered the dwelling of Gov. Wright and took him prisoner (June 17, 1775), the first bold revolutionary act performed in Georgia. When Savannah was captured by the British, Mr. Milledge escaped to South Carolina, where he was captured by a party of Americans, and very nearly hanged as a spy. He was present at the unsuccessful siege of Savannah under the count D'Estaing and Gen. Lincoln, and also at the siege of Augusta; and in South Carolina and Georgia, at various places and on various occasions, he did valuable service in the patriot army. In 1780 he was appointed attorney-general, and afterward served frequently in the state legislature. In 1802 he was elected governor of Georgia, and served two terms. He was a representative in Congress from 1792 to 1802, except one term, and U. S. senator from 1806 to 1809. He was the principal founder of the university of Georgia, and purchased and presented the lands on which Athens, the seat of the university, is built. By a special act of the legislature the capital of the state was called Milledgeville in honor of his memory.

MILLEDGEVILLE, the capital of the state of Georgia and of Baldwin co., situated in the midst of a cotton-growing region, on the W. side of the Oconee river, in lat. 33° 4' 10" N., long. 82° 19' 45" W.; pop. about 2,500. The principal public buildings are the state house, a large semi-Gothic structure, the governor's mansion, and Baptist, Episcopal, Methodist, and Presbyterian churches.

MILLENNIUM (Lat. *mille*, 1,000, and *annus*, a year), a period of 1,000 years. In theology this term generally designates the doctrine of a return of Jesus Christ in person before the end of the world, of a first or particular resurrection of the just, who are to reign with Christ on earth, and of the destruction of Antichrist. Those who hold such views are called millenarians or chiliasts (Gr. *χίλιαι*, 1,000). It is admitted on all sides that millenarian views were, if not general, at least very common in the ancient church. The belief was generally founded on Pa. xc. 4, according to which 1,000

years are before the Lord as one day, compared with the account of the creation as given by Moses, the 6 days of creation being taken as designating 6,000 years of toil, and the subsequent sabbath as designating 1,000 years of rest and happiness. Beside these passages, Rev. xx. 1-6 is especially quoted by millenarians in support of their views. Millenarianism prevailed chiefly among the Jewish Christians, who retained after their conversion the hope of the Jewish nation, that they would rule over all other nations under a royal Messiah. The Ebionites, the Nazareans, and Cerinthians all strongly advocated it; and Montanus, and the sect which was called after him, regarded it as a fundamental doctrine of the Christian religion. The early fathers of the church also declared themselves generally in favor of the doctrine; Papias, Justin, Irenæus, and Tertullian all clearly teach it; and Papias appealed in support of his view to apostolic traditions. On the other hand, however, the Epistles of Clement of Rome and Ignatius of Antioch, and the Epistle to Diognetus, are silent about it. Justin, though himself a believer in the millennium, knew many orthodox Christians who were not; yet none of the apostolic fathers openly opposed it. The first opponent of whom we know was the Roman presbyter Caius, who designated the doctrine as an invention of the arch-heretic Cerinthus. He was soon followed in his opposition by the whole Alexandrian school, especially by Origen; and it is regarded as certain, that at this time the churches of Rome and Alexandria rejected the doctrine. Still it continued to find advocates during the 8d century, among whom Tertullian, Nepos, bishop of Arsinoë, and Methodius, bishop of Tyre, were prominent. In the 4th century, though it had still many adherents among the people, it found no longer any advocate of note among the Christian writers; yet Jerome, who did not believe in it himself, did not dare to condemn it, in consideration of the many pious and learned advocates it had found in former centuries. From the 5th century, millenarianism began to die out; it was temporarily revived, toward the close of the 10th century, by the popular belief in the approaching end of the world, and a little later by the abbot Joachim de Floris, the Spirituals, the Apostolic Order, Peter de Oliver, and other heretics of the middle ages; but it never regained great strength.—The reformation of the 16th century gave a new impulse to the millenarian views. Common opinion identified the pope with Antichrist, and regarded the expected downfall of the church of Rome as foreshadowing the approach of the millennium. But when the Anabaptists assumed in 1534 to erect the new Zion, both the Lutheran and Reformed churches declared themselves against this caricature of the old Christian doctrine. Yet, although little favored within the state churches, it was preached with enthusiasm by many sects and theologians of the 16th and 17th centuries, among

whom were Weigel and the Moravian bishop Comenius in Germany, Jurieu in France, the Labadists in the Netherlands, and Joseph Mede and Jane Lead (died 1704) in England.—A third period in the history of millenarianism may be commenced with the writings of the esteemed theologian Johann Albrecht Bengel. He reintroduced it into Protestant theology, where it has ever since been advocated by a number of prominent theologians. The ingenious prelate Oetinger (died 1782) brought it into connection with his favorite theosophic views. Hahn (the founder of a pietistic sect in Württemberg), Stilling, Lavater, and Hass gave it a wide circulation among the lower classes of the people in Germany and Switzerland. With Rothe (*Theologische Ethik*, vol. ii.) millenarianism forms an organic link in his theosophic system. In opposition to the "spiritualism" of modern exegesis, it was advocated, with exegetical arguments, by Hoffmann, Delitzsch, Kurtz, Hebart, and others; while Thiersch, Nitzsch, P. Lange, and Ebrard supported it from a dogmatical as well as an exegetical standpoint. Swedenborg taught that the last judgment took place in 1757, and that the New church or church of the New Jerusalem had actually been formed both in heaven and on earth. After Germany, England and America have been the chief fields of modern chiliasm. The "Catholic Apostolic Church," organized by Edward Irving, laid great stress on the belief that the kingdom of glory was very near. Millenarian views lie also at the foundation of Mormonism, the people who hold that belief calling themselves "Latter Day Saints" in reference to the near approach of the last day. In the United States a great agitation was called forth by the preaching of William Miller, who sought to prove from the Scriptures that the second advent of Christ would occur about 1843. He not only found numerous believers in most denominations, but also occasioned the organization of a new denomination of Adventists.—Numerous as the millenarians have been in various periods of the Christian church, their views widely differ respecting most points, except the duration of the millennium, which nearly all of them fix at 1,000 years. The beginning of the millennium was fixed by Hippolytus at the year 500, by Jurieu at 1785, by Bengel at 1836, and by others at other dates. Many agree in expecting it between 1879 and 1887. Commonly the earth is believed to be the only place of the millennium, and Jerusalem its central point of union.—A good history of millenarianism in the Christian church is still a desideratum, as the works published do not exhaust the subject. See Corrodi, *Kritische Geschichte des Chiliasmus* (Frankfort, 1781); D. T. Taylor, "The Voice of the Church on the Coming and Kingdom of the Redeemer; a History of the Doctrine of the Reign of Christ upon Earth," revised by Hastings (2d ed., Peacedale, R. I., 1855).

MILLEPORE (*millepora*, Linn.), a genus of hydroid medusæ. The animals live in communities, which take on various arborescent

and incrusting shapes; they deposit much carbonate of lime in their tissues, so that the medusa stock is in outward appearance almost solid, with minute pores on the surface which contain the animals. A cross section of this stony skeleton shows that the minute individuals of the community constantly grow outward in the direction of their longitudinal axis, forming as they proceed long calcareous tubes, which are so intimately cemented together as to make a compact mass. Across these tubes, at short intervals, there are formed little transverse platforms, which divide the tubes into joints or cells. These platforms are deposited by the base of the animal, and are of high importance in classification; by them is characterized Milne-Edwards's division of the *tabulata*, which includes *millepora*. Till within a short time all zoologists have placed the millepores among polyps; Prof. Dana, for instance, ranks them in the family of *fasciitids* in the tribe *madreporacea*, in his "Synopsis of the Report on the Zoophytes of the U. S. Exploring Expedition" (1859). In the winter of 1857-'8 Prof. Agassiz succeeded, for the first time, in observing the animals of *millepora alciornis* in Florida, and was surprised to find them not polyps, but true hydroid medusae, resembling *hydractinia*. This observation gives great importance to the medusae, as represented among the fossils, for the *tabulata* are found abundantly as low as the silurian formations.—See the "British Fossil Corals," by Milne-Edwards, in the "Transactions of the Palaeontographical Society;" Dana's "Zoophytes;" the "American Journal of Science," vol. xxvi. p. 140 (1858); and Agassiz's "Contributions to the Natural History of the United States," vol. iii.

MILLER, a central co. of Mo., traversed by Osage river, here navigable during 3 or 4 months of the year; area, 570 sq. m.; pop. in 1856, 4,024, of whom 165 were slaves. The surface is diversified and well timbered with walnut, sugar maple, and other valuable woods. The soil of the river bottoms is fertile. The productions in 1850 were 144,994 bushels of Indian corn, 14,724 of wheat, 84,608 of oats, and 182 tons of hay. Capital, Tusculumbia.

MILLER, EDWARD, an American physician and author, born at Dover, Del., May 9, 1760, died in New York, March 17, 1812. He received his early education at home, and at the age of 14 was sent to the Newark academy in Delaware. After leaving the academy he commenced the study of medicine under the direction of Dr. Charles Ridley, an eminent physician of Dover, and attended two courses of medical lectures in the university of Pennsylvania, after which he spent about a year in the military hospital at Baskingridge, N. J., in the capacity of a surgeon's mate. In 1782 he went to France as the surgeon of an armed ship. On his return in 1788 he entered on the practice of medicine, first in Somerset co., Md., and afterward in his native town. In 1785 he received the degree of M.B., and in 1788 was graduated as M.D. in the university

of Pennsylvania. In Dover he continued 10 years in an extensive practice, and in 1796 he removed to the city of New York. Within a few months after, with Dr. Mitchell and Dr. Smith, he commenced the publication of the "Medical Repository," the first American medical journal. He early lost by death the co-operation of Smith, but continued with his colleague Mitchell the regular issue of the work to the completion of the 14th annual volume. In 1808 he was appointed resident physician for the city of New York, which office he held, with the intermission of one year, to the close of his life. In 1805 he was elected a member of the American philosophical society, and upon the organization of the college of physicians and surgeons of New York was appointed by the regents of the university professor of the theory and practice of physic in that institution. In 1809 he was chosen one of the physicians of the New York hospital. His chief publications, beside his inaugural dissertation, were his medical papers in the "Repository," and his "Report on the Yellow Fever of New York in 1805," in a letter to Gov. Lewis. This last document secured him a wide renown, and is the source from which most authors of a more modern date have drawn their arguments in behalf of the doctrine of the domestic origin and non-contagious nature of yellow fever. His medical writings, with a biographical sketch, were published by his brother, the Rev. Samuel Miller, D.D. (8vo., 1814).

MILLER, ÉMANUEL, a French philologist, born in Paris in 1809. In 1834 he received an appointment in the manuscript department of the royal library, and in that capacity made visits to some of the principal libraries of Spain and Italy, whence he procured copies of valuable original manuscripts. Among the results of his explorations were a *Supplément aux dernières éditions des petits géographes Grecs* (8vo., 1839); *Catalogue des manuscrits Grecs de la bibliothèque de l'Escurial* (4to., 1848); and *Poésies Grecques inédites de Manuel Phile*. In 1851 he published at Oxford, under the title of "Refutation of Heresies," the text of a manuscript procured from Mt. Athos by M. Minoïde Mynas, and which he believed to be an original treatise of Origen. Of this work, since generally attributed to Hippolytus, he has announced a translation. In 1840-'46 he published 6 volumes of a *Revue de bibliographie analytique*, which met with but moderate success; and he has edited a number of minor Greek authors, beside contributing largely to the *Journal des savants*. He was also one of the principal editors of the *Recueil d'itinéraires anciens* (4to., 1844).

MILLER, HUGH, a British geologist, born in Cromarty, on the E. coast of Scotland, Oct. 10, 1802, died at Portobello, near Edinburgh, Dec. 26, 1856. He belonged to that half Scandinavian population inhabiting the shores of the German ocean from Fife to Caithness. On his father's side he was 4th in descent in a line

of sailors from John Feddes, one of the last of the buccaneers on the Spanish main, who returned to Cromarty to enjoy his money, and built "the long, low house" in which his distinguished great-grandson passed his youth. On his mother's side he was of highland blood, and 5th in descent from Donald Roy of Ross-shire, famed for his piety and his second sight. His father was drowned in a tempest, a fate which had befallen several of his ancestors, in 1807; and from that time, though still living with his mother, he was chiefly under the care of two maternal uncles, who had greater influence and authority over him until the age of manhood than any other persons. One was a harness maker and the other a cartwright, and he accounts them the most important of his schoolmasters. Uncle Sandy (Alexander) encouraged his early bent toward natural history, and taught him much about rocks, cloude, rains, tides, trees, ferns, shell fish, sea fowl, and insects. Uncle James interested him in human history, and gave him his liking for traditional lore, Scottish antiquities, social habits, and individual eccentricities. The tastes and predilections of both uncles were deeply impressed on him, and wherever he went in later life the geology and humanity of the district seemed equally to attract him. In his 5th year he was sent to a dame's school, where he learned to read—"that grand acquirement of my life." He was thence transferred to the grammar school of Cromarty, where he went through the ordinary course of rudimentary studies. He even began Latin with a view to college, but from distaste failed in it completely, being usually at the nether end of a very poor class, which position even he maintained only by displaying an unaccountable facility in translation. The master read aloud every morning in English the task assigned for the day, and Hugh was able to remember the whole rendering in its order, and to give it back in the evening word for word. Much of the leisure secured in this way was employed in reading translations from the classics by stealth. About his 15th year he attended for some time a subscription school set up as a rival to the grammar school. But from this whole amount of pedagogy he derived, according to his own estimate, only one advantage, namely, the faculty of reading books, with the correlative accomplishment of writing. From the time when he groped his way through the shorter catechism and the Proverbs into the Bible class at the dame's school, he had been an omnivorous reader. First came a course in the classical romances of childhood, "Jack the Giant Killer," "Jack and the Bean Stalk," the "Yellow Dwarf," "Blue Beard," "Sindbad the Sailor," "Aladdin and the Wonderful Lamp," and other similar works. Pope's translation of Homer, the "Pilgrim's Progress," "Robinson Crusoe," "Gulliver's Travels," the "Miracles of Nature and Art," the "Adventures of Phillip Quarll," the voyages of Byron, Anson, Drake, Dampier, and Raleigh,

and several works on Scottish martyrology, had all been perused with avidity before his 11th year. At that age his uncle James placed in his hands a copy of Blind Harry's "Wallace," as modernized by Hamilton, which was followed by Barbour's "Bruce," and occasioned a fit of enthusiastic Scotticism. He had already acquired a reputation among his class fellows as a narrator of stories; and having exhausted the subjects of his reading and the various adventures that he had himself heard told, he was accustomed to extemporize with great success the wildest biographies. The British essayists, Pope, a collection of minor poems, &c., of the wits of Queen Anne, Goldsmith, Shakespeare, and divers translations from Latin, French, and German, had been added to his miscellaneous intellectual stock before his 17th year. Moreover, he had begun to write verses; and his last exploit as a school boy was to engage in a fight with his master on the school floor, and, in revenge for having been thrown, to write a poetical satire upon him. Meantime, other branches of his education had been going on outside of the school. He was the leader in excursions along the precipices and into the caves on the coast. He had learned to collect on the beach and to distinguish from each other the various rocks of the locality, as porphyries, granites, gneisses, quartz, and mica schists, and had discovered for himself that Cromarty possessed among its minerals one precious stone, the garnet; and his observations in other departments had been encouraged and corrected by his uncle Sandy, who, as he always claimed, knew more of living nature than many professors of natural history. He had studied scenery, customs, and physiognomies in the highlands of Sutherlandshire, among his Gaelic cousins; had heard the story of Culloden from men who fought in the battle; had conversed with an old lady who witnessed the last witch-burning in the north of Scotland; and had acquired a habit, which marks his life and his writings, of studying historical monuments as well as geological formations, collecting local legends as well as fossils, delighting as much to discover a kelpie as a pterodactyl, and regarding types of character and phases of society in connection with the facts of science. The foremost youth in the district, his uncles wished him to prepare for Aberdeen college, and there to study for the church; but he demurred, declaring that he had no call to the sacred office, and they admitted that he had better be any thing than an uncalled minister. A trade was therefore resolved upon, and he was apprenticed for 3 years to one of his relatives, who was a stone mason. From his 17th till his 24th year he led the life of an operative mason, journeying in summer to pursue his labors in different parts of Scotland, devoting all his leisure to earnest intellectual cultivation, reading all kinds of books on summer evenings and at home during the winter, and cherishing a belief from the beginning that literature and perhaps nat-

ural science would after all prove his proper vocation. During the first part of this period (1818-'25), as an apprentice and journeyman, he was subjected to all the coarse and rough experiences of his trade, working as one of a gang in quarries or in sheds, and passing his evenings in wretched highland bothies or in hovels in lowland villages. He afterward exchanged the life of a journeyman, working season after season for different masters, for that of a jobbing mason, undertaking private commissions in the way of his trade, such as the sculpturing and lettering of tombstones, stone dials, and the like; yet his habits of work continued in all respects to be those of a common mason, and his domestic accommodations those of any frugal Scotch mechanic. During this most laborious period of his life he formed an intimate and extensive acquaintance with the best English and Scotch literature, embracing not only the departments of fiction, history, and poetry, but the philosophical works of Locke, Kames, Hume, Reid, Adam Smith, and Dugald Stewart. The latter he seems to have grappled with rather as a matter of conscience than of real liking. He seized upon every work of natural science that fell in his way, and moreover wrote a great variety of verses, rhapsodies, and reflections. His various scenes of labor made him familiar with the scenery, antiquities, and social peculiarities of different parts of Scotland. But his greatest progress was in geology. Starting with hardly more than an empirical knowledge of the mineral characters of rocks, he soon detected the wonders of the fossil world in quarries remarkably rich in organisms. Wherever he went, from the shores of the Moray frith to those of the frith of Forth, the hammer was in his pocket, and his eye was searching for fossil specimens. Combining what he saw with what he read, he became, while yet hardly aware of it, not only a self-taught geologist, but a geologist capable of teaching others. To this period belong his discoveries in the old red sandstone, which only required to be known to insure him distinction in the scientific world. He had many friends, whom he has strikingly characterized in his work entitled "My Schools and Schoolmasters," with whom he came into more or less frequent contact, and who exercised an educating power upon him. There were John Fraser, the prince of north country masons, who could do with ease 8 times as much work as any other man; Dr. McCrie, the biographer of John Knox; "Charles," the black-guard hero of the south country squad; and above all others William Ross, the house painter, weak-bodied and diffident, but with the genius of a poet and artist, who seems to have been *par excellence* the friend of his life. In 1825, work failing in the north, he sailed for the south of Scotland, and went from Leith to the capital. There he was occupied for two years, till his health began to fail, and he learned that few Edinburgh stonecutters pass their 40th year, and not one in 50 reaches his 45th. He

therefore returned to Cromarty, accustomed to contemplate with rather pensive than sad feelings an early death, and soon after became seriously interested in the personal bearing of religious concerns. Until this time he describes himself as wavering between two extremes, now a believer and anon a sceptic, the belief being instinctive, the scepticism the result of some intellectual process. The result of his thoughts and conversations was that he found rest in the fundamental principles of Scottish evangelicism. His attainments soon made him a local celebrity; geologists in other towns corresponded with him; Cromarty ladies began to walk up to where he was at work to have the pleasure of conversing with him; and he was honored by an election to the office of town councillor. He published a volume of "Poems written in the Leisure Hours of a Journeyman Mason" (1829); contributed a series of letters to the "Inverness Courier" on the herring fishery, which were collected in a volume; discovered deposits of ichthyic remains belonging to the second age of vertebrate existence, sufficient to prove not only the existence but the structure and varieties of fishes at that early period; and at length exchanged manual labor for the office of accountant in a branch bank opened at Cromarty. During the first two years of his accountantship his marriage took place, his "Scenes and Legends of the North of Scotland" was published, and he became a frequent contributor to periodicals. The non-intrusion controversy was then at its height in the Scottish church, and immediately after the adverse decision of the house of lords in the Auchterarder case he published his celebrated "Letter to Lord Brougham," which, as Mr. Gladstone affirmed, showed a mastery of pure, elegant, and masculine English that even an Oxford scholar might have envied. The leaders of the Free church were then looking for a man to edit their contemplated organ, and at once selected Mr. Miller, who in 1840 removed to Edinburgh as editor of the "Witness." As a Scottish journalist he held a high and almost unique place. His leading articles were essays remarkable for their deliberate thought, elevated moral tone, strong Presbyterian feeling, and fine literary finish, and exerted a powerful influence on the formation of public opinion. His genius for description, literary culture, and relish for peculiar social characteristics appear also in his account of a vacation tour, entitled "First Impressions of England and its People." But his greatest eminence was achieved in the department of practical and speculative geology. He went to Edinburgh with the results of many years of scientific observation and reflection, with a collection of belemnites, fossil fishes, and other objects of natural history, and with a collection of thoughts and speculations about them, which in his own judgment formed his most valuable capital. During the first year of his editorship he published a series of papers, afterward known col-

lectively under the title of "The Old Red Sandstone, or New Walks in an Old Field," in which he detailed the story of his researches and revealed his discoveries of fossils in a formation which had till that time been deemed almost destitute of them. These were immediately recognized by savants as important additions to geological science. At the meeting of the British association in 1840 his labors were the principal theme; the fossils which he had picked up in boyhood in his native district were promoted to their due rank as *pterichthys Milleri*; and Murchison and Buckland spoke of his descriptive talent as casting plain geologists like themselves into the shade, and making them ashamed of their meagre style. His severe tasks endangered his health and compelled him to forego all literary labor during the greater part of 1845 and 1846; but he returned from his seclusion only to be more intimately associated with Dr. Chalmers in the counsels of the Free church. The appearance and popularity of the "Vestiges of the Natural History of Creation," embodying the development theory, and aiming to transfer the work of creation from the realm of miracle to that of natural law, caused him to prepare a reply, entitled the "Footprints of the Creator, or the Asterolepis of Stromness," an able and strongly fortified exposition of the opposite view, which had a very wide circulation in England and America. One of his most interesting works is "My Schools and Schoolmasters, or the Story of my Education," a full review of his life until the time of his settlement in Edinburgh. He published in 1848 the "Geology of the Bass Rock," lectured on geological subjects in Edinburgh and London, read papers before the British association, and had just completed at the time of his death his "Testimony of the Rocks," in which he discusses the biblical bearings of geology. He toiled upon this task night and day, with little sleep or exercise, until, after a week or two of cerebral disorder, he himself became conscious that his mind was on the verge of ruin. He felt occasionally as if a very fine poignard had been suddenly passed through and through his brain, and in some of his paroxysms his face was a picture of horror before which even his wife shrank in dismay. He was found lifeless in his study, his chest pierced with the ball of a revolver pistol, which was found lying close by. It appeared that a trance more harrowing than ever befell him, and on waking he must have meditated self-destruction. In a pathetic note left for his wife, he wrote: "A fearful dream rises upon me. I cannot bear the horrible thought." His principal works have been republished in America.—See the "Life and Times of Hugh Miller," by Thomas N. Brown (republished, New York, 1860).

MILLER, JAMES, an American general, born in Peterborough, N. H., April 25, 1776, died in Temple, N. H., July 7, 1851. He was educated for the bar, but in 1808 entered the army as major in the 4th infantry. In Aug. 1812, he

was brevetted as colonel for distinguished services, and in the succeeding May participated with credit in the capture of Fort George. In March, 1814, he was appointed colonel of the 21st infantry, in which capacity he accompanied the invading army of Brown into Canada, and fought with gallantry at the battles of Chippewa and Lundy's Lane. The success of the Americans in the latter conflict was mainly due to the capture of a British battery by his command, and his name was long celebrated in connection with his reply to Gen. Scott's inquiry if he could take the battery: "I'll try, sir." For these services he was brevetted as brigadier-general, and received from congress a gold medal. He resigned his commission in the army in 1819, upon being appointed governor of Arkansas territory, which office he held until March, 1825. In the latter year he was made collector of customs in Salem, Mass., where he remained until 1849, when he retired into private life.

MILLER, JOSEPH, an English comic actor, whose name has long been associated with the literature of facetiae, born probably in London in 1684, died there in 1788. He was a popular actor on the English stage in the early part of the last century, and performed with repute in several of Congreve's best comedies, particularly in "Love for Love" and the "Old Bachelor," to the success of which he is said to have materially contributed. In 1789 a book of jests passing under his name, and supposed to be the compilation of John Mottley, author of a life of Peter the Great, was published in London, and has since gone through numerous editions. As one of the chief repositories of English humor of the broader kind, it has gained a celebrity which preserves the name of its assumed author.

MILLER, SAMUEL, an American divine, born near Dover, Del., Oct. 31, 1769, died in Princeton, N. J., Jan. 7, 1850. He was the son of the Rev. John Miller, a native of Boston, who early settled as a Presbyterian clergyman in Delaware, and brother of Edward Miller, M.D. He was graduated at the university of Pennsylvania in 1789, studied theology, partly under his father and partly under Dr. Nisbet, president of Dickinson college, was licensed to preach by the presbytery of Lewes in 1791, and in June, 1798, was installed as colleague pastor with Drs. Rodgers and McKnight of the first Presbyterian church in the city of New York. In 1804 the degree of D.D. was conferred upon him by his *alma mater*; and in 1806 he was moderator of the general assembly of the Presbyterian church. In 1818 he accepted the professorship of ecclesiastical history and church government in the theological seminary at Princeton, and continued to discharge the duties of this office with great fidelity and ability till near the close of his life. He tendered his resignation to the general assembly in May, 1849, and in accepting it they testified in the strongest manner their high appreciation of his character and services. Dr. Miller was a devoted friend of the Presbyterian church, and enlisted vigorously in the

controversy which resulted in its division, though he was always a model of controversial dignity and decorum. He was the author of "A Brief Retrospect of the Eighteenth Century" (2 vols. 8vo., New York, 1808; 8 vols. 8vo., London, 1805); "Letters on the Constitution and Order of the Christian Ministry" (12mo., 1807), with a "Continuation" (1809); "Memoirs of the Rev. John Rodgers, D.D." (8vo., 1813); "Letters on Unitarianism" (8vo., Trenton, 1821); "Letters on Clerical Manners and Habits" (12mo., Philadelphia, 1827); "An Essay on the Office of Ruling Elder" (12mo., New York, 1831); "Letters to Presbyterians" (1838); "Discourses on Infant Baptism" (1834); "Presbyterianism the truly Primitive and Apostolic Constitution of the Church of Christ" (Philadelphia, 1835); "The Primitive and Apostolic Order of Christ vindicated" (1840); "Letters from a Father to his Sons in College" (1843); "A Sermon on the Ruling Eldership, with an Appendix" (1843); "Thoughts on Public Prayer" (1849). He also wrote the "Life of Jonathan Edwards" in Sparks's "American Biography," and published upward of 40 occasional discourses, addresses, and lectures, in pamphlet form, with several biographical sketches, introductory essays to the works of others, &c.

MILLER, STEPHEN FRANKS, an American lawyer and author, born in North Carolina. In early youth he removed to Georgia, where he was admitted to the bar in his 22d year, soon after which the legislature elected him solicitor-general of the southern circuit. When his term of office expired he became a citizen of Alabama, where he continued the practice of his profession until a severe bronchial affection compelled him to engage in other pursuits; and from 1840 to 1847 he edited "The Monitor," a whig journal published at Tuscaloosa. In 1848 and 1849 he resided in New Orleans, where he was associated in the editorial management of "De Bow's Review" and the "Daily Commercial Times." His health failing, he removed to Oglethorpe, Ga. He is the author of the "Bench and Bar of Georgia" (2 vols., 8vo., Philadelphia, 1858); "Wilkins's Wylder, or the Successful Man" (1860); and of a memoir of the late Gen. David Blackshear.

MILLER, THOMAS, an English author, born in Gainsborough, Lincolnshire, Aug. 31, 1809. His parents, being in humble circumstances, could give him no better education than mere reading and writing, and he became a farmer's boy. He devoted his leisure hours to study, and while following the trade of a basket maker began to attract attention by his poetical effusions and by occasional pieces in prose, chiefly describing rural life and scenery. Coming under the notice of Moore, Campbell, and Rogers, the last named enabled him to establish himself as a bookseller, and thenceforth he became an industrious writer. Among his numerous prose works are "Royston Gower," "Fair Rosamond," "Lady Jane Grey," "Godfrey Malvern," and other novels; a "History of the Anglo-Saxons;"

lives of Turner, Beattie, Collins, &c.; and particularly his country books, including "A Day in the Woods," "Beauties of the Country," "Rural Sketches," "Pictures of Country Life," "Country Scenes," &c. In 1842 appeared his first volume of poems, a collection of pieces contributed to various periodicals. He subsequently published the "Language of Flowers" and other pieces in verse.

MILLER, WILLIAM, the founder of the sect of Millerites or Second Adventists, born in Pittsfield, Mass., in 1781, died in Low Hampton, Washington co., N. Y., Dec. 20, 1849. In the war of 1812 he commanded a company organized to protect the northern frontier, and held the commission of captain. His early facilities for education were slight, and he seems never to have been master of what are usually deemed the requisite resources for biblical criticism; but in 1833 he began to lecture on the speedy second coming of Christ, announcing, in accordance with his interpretation of the prophecies, that the earth was to be destroyed in 1843. Even the day was specified, if not by himself, by some of his principal followers. His earnest and confident manner attracted attention, his scriptural and historical arguments seemed to many erudite and cogent, and after a few years of constant travel and preaching his disciples were reckoned at from 30,000 to 50,000. They belonged not only to the United States, but to British America and Great Britain, and had a weekly organ, the "Advent Herald," edited and published in Boston, and still continued, by the Rev. J. V. Himes. After the failure of their prediction in 1843, the interpretations of the leaders of the sect varied somewhat, but several different years and days were successively designated for the termination of all things; and in some localities the Millerites more than once attired themselves in white and stationed themselves in graveyards and on the roofs of houses, waiting for the appearance of the Lord. The sect still exists, but with greatly diminished numbers, and holds that the second advent of Christ is very near, without claiming to be certain of the precise date.

MILLER, WILLIAM ALLEN, an English chemist, born in Ipswich, Suffolk, Dec. 17, 1817. He was educated at the merchant tailors' school and at the school of the society of Friends at Ackworth, Yorkshire, and at 15 years of age was apprenticed to his uncle, who was surgeon to the general hospital in Birmingham. At the expiration of 5 years he entered the medical department of King's college, London, where he pursued the study of chemistry under Dr. Daniell, whom he occasionally assisted in his laboratory. In 1840 he passed some time in the laboratory of Liebig in Giessen, and in the same year took his degree of M.D. and became demonstrator of chemistry in King's college. In 1845 he succeeded Prof. Daniell in the chair of chemistry, a position which he still holds. He has contributed numerous papers to the scientific periodicals, and is the author of an important

treatise entitled "Elements of Chemistry, Theoretical and Practical." He is president of the chemical society, assayer to the mint and to the bank of England, and was until recently vice-president of the royal society.

MILLER, WILLIAM HALLOW, an English physicist, born about the beginning of the present century. He was graduated at St. John's college, Cambridge, in 1836, subsequently became a fellow and tutor of the same college, and in 1832 succeeded Prof. Whewell in the chair of mineralogy, which he still occupies. He is the author of several papers on crystallography, published in the "Transactions" of the Cambridge philosophical society, and was one of the first to introduce into England the method of representing crystalline forms by their spheres of projection, and to employ Dr. Wollaston's goniometer in the measurement of the angles of crystals. A more important production than any of these was his edition of Phillips's "Elementary Introduction to Mineralogy" (8vo., 1853), prepared in conjunction with Henry J. Brooke, but of which the greater part was done by himself, the original treatise being reconstructed and enlarged. In 1838-'40 he afforded the parliamentary commission appointed to investigate the subject many valuable suggestions with reference to the new standard of weight intended to replace that lost at the destruction of the houses of parliament in 1834; and in 1848 he became a member of a second commission for superintending the construction of new parliamentary standards of length and weight, the report of which in 1854 ascribes the chief credit for the successful termination of its labors to his exertions. On this subject he read before the royal society a paper "On the Construction of the Imperial Standard Pound and its Copies of Platinum, &c." Among his other published works are "Elements of Hydrostatics," "Treatise on Crystallography," and "Treatise on the Differential Calculus."

MILLET (Lat. *milium*), a name applied to several distinct plants of the natural order *graminaceæ*, remarkable for their fertility in seed-bearing. The millet cultivated for centuries in Europe and Asia seems to be designated by Linnæus as the *panicum miliaceum*, an annual grass, native of India and known as *warree*. Its early cultivation in the East seems determined by being mentioned in Sanscrit writings, and it is averred that two sorts were introduced into China in 3822 B. C. The Hungarian millet (*panicum Germanicum*) has been cultivated in Massachusetts to some extent from seeds received from the patent office at Washington. It is an annual forage plant introduced in 1815 into France, where its cultivation has become considerably extended; it is thought to contain a large percentage of nutriment. This species is probably identical with the Italian *setaria*, or Bengal grass (*setaria Italica*, Beauvais; var. *Germanica*, Kunth), having an annual root; stem 4 or 5 feet high; leaves 12 to 18 inches long, rather broad, flat, serrulate on the margins;

sheaths striate, pubescent on the margin; ligules beard-like. Its mode of inflorescence is in a sort of contracted panicle resembling a spike, which is 8 to 6 inches long and of a sub-cylindrical shape. Some years ago the culture of this plant was introduced into Pennsylvania, and excited considerable interest for some time among the farmers, as affording valuable fodder when the usual hay crop was deficient. It was soon found, however, not to be as valuable as the usual fallow crops of oats and barley, of which it occupied the place, and was moreover remarkably liable to damage from rain; and the cultivation was soon abandoned. The seeds of millet are sometimes used for human food, but they are chiefly employed in feeding fowls and domestic animals. A bushel of seeds has been produced on 6 square rods of land. There are several species of *setaria* which appear in waste places and are regarded as weeds, but having the same characteristics in respect to producing abundance of seeds. Among these are *S. viridis*, or green bottle grass, with a cylindrical, green, bristly, compound spike; *S. verticillata*, with the spike made up of interrupted verticils of spikelets, and the bristly involucres of the florets retrose, scabrous; also the glaucous-leaved bottle grass (*S. glauca*), with broad leaves, and long, dense, cylindrical spikes, which turn to a tawny yellow color as they ripen their seeds, regarded as pests in gardens, and appearing after the usual weedings are over. These, though vulgar weeds and very ordinary grasses, are yet in natural affinity related to the millet.—In the colder woods of the northern United States is a plant designated as millet grass (*milium effusum*, Linn.), with a smooth stem 3 to 6 feet high; broad, flat, and thin leaves; a spreading panicle 6 to 9 inches long. This plant is of no known value, but is a representative of the genus *milium*, which, according to Persoon, embraces 15 species growing in widely separate regions of the globe. The Indian millet, or the *durra*, is however a species of *sorghum* (*S. vulgare*, Pers.), as also the drooping millet or Guinea corn (*S. cornutum*, Willd.), both natives of India. This genus is represented in our cultivation by the broom corn (*S. saccharatum*); and the Chinese sugar cane, *imphae*, or *sorgho suora*, is well known. Mr. Charles J. Sprague, in the "Proceedings of the Boston Society of Natural History" for April, 1858, arrives at the conclusion, after careful examination of 81 specimens of what were sent to him for 4 distinct species, that the *sorghum vulgare* or Indian millet is the parent and type of this group; a plant which has been cultivated for untold centuries as forage and as food for man and animals. The sorghums, according to Dr. Charles Pickering, are all tropical and oriental plants, he never having found any species on the islands of the Pacific. Some species of *holcus* (Linn.), which formerly included many forms now known as *andropogon* and *sorghum*, are mentioned as among the most important kinds

of millet. Of these, one of the largest is the black millet (*H. niger*) of Arduino, who wrote on the genus *holcus* or *sorghum* in 1786. At the Cape of Good Hope is a species known as the Caffre millet (*H. Caffer*) of the same author; and in Persia is a species called the two-colored millet (*H. bicolor*, Linn.).

MILLIN, AUBIN LOUIS, a French archæologist, born in Paris, July 9, 1759, died Aug. 14, 1818. He was keeper of the museum of antiquities in the national library. His principal works are: *Peintures des vases antiques; Monuments antiques inédits; Galerie mythologique; Voyage dans les départements du midi de la France, and Histoire métallique de la révolution Française*. His "Medallic History of Napoleon," left incomplete, was published in English by J. Millingen (London, 1819). He was the founder of the *Magasin encyclopédique* and *Annales encyclopédiques*.

MILLOT, CLAUDE FRANÇOIS XAVIER, a French ecclesiastic and historian, born at Ornans, Franche Comté, in 1726, died in Paris, March 21, 1785. He entered the order of Jesuits, and became professor of rhetoric at their college in Lyons; but his relation with them was brought to a close by their objections against his eulogy of Montesquieu. He now devoted himself to the preparation of historical works suited for schools, which obtained for him in 1768 the chair of history at the college of nobles in Parma founded by the marquis de Felino. In 1777 he became a member of the French academy, and in 1778 preceptor of the duke d'Enghien; and he afterward received a pension of 4,000 francs. His works on French, English, and general history were united under the title of *Œuvres de l'abbé Millot* (15 vols., 1800).

MILLS, a S. W. co. of Iowa, bordering on Nebraska, from which it is separated by the Missouri river, and drained by the Nishnabotona river and branches; area, about 400 sq. m.; pop. in 1859, 4,381. The productions in 1859 were 326,218 bushels of Indian corn, 10,420 of wheat, 26,907 of potatoes, 8,878 of oats, 80,937 lbs. of butter, and 3,540 of wool. Capital, Greenwood.

MILLS, CHARLES, an English historian, born at Greenwich in 1788, died in London in 1825. He studied law, but abandoned it for literary pursuits. His principal works are: "History of Mohammedanism" (8vo., London, 1817); "History of the Crusades" (2 vols. 8vo., 1819); and "History of Chivalry" (2 vols. 8vo., 1825).

MILLS, CLARK, an American sculptor, born in Onondaga co., N. Y., in 1815. He lost his parents in his childhood. He commenced learning the trade of a millwright, but soon abandoned it for that of a plasterer. In 1835 he went south, and after a brief residence in New Orleans settled in Charleston, S. C., where he worked at his trade for 9 years. From the time he was 22 years of age he manifested a taste for sculpture, and devoted all his leisure to its study, and to experiments in forming plaster busts. He at length began to attract atten-

tion, and undertook a marble bust of John C. Calhoun; and although his first effort was much ridiculed, he persevered, and in 1846 finished a bust which was purchased by the city of Charleston and placed in the city hall, where it was greatly admired. The city also presented Mr. Mills a gold medal. After this he executed several busts of distinguished persons in South Carolina, which increased his reputation. In the mean time some friends offered to furnish the means to enable him to go to Italy to study his art. He eagerly accepted their assistance; but while visiting Washington in 1848, to examine works of art there, prior to his voyage, he was requested to furnish a design for the proposed equestrian statue of Gen. Jackson. The proposition took Mills by surprise. He had never seen an equestrian statue in his life; but, convinced on reflection of his ability to execute the work, he abandoned his purpose of going to Italy, returned to Charleston, and completed the model in 8 months. The committee at Washington accepted it, and made a contract for the execution of the work. On ground belonging to the government in Washington, near the treasury department, Mr. Mills erected a small frame building for a residence and workshop. He first made a full-sized model of the group in plaster, which occupied him two years, and, being exhibited to the public, excited much admiration. The horse rested upon the hind feet, and was perfectly balanced. This attitude had never been so employed before; critics, artists, and scientific men declared that it could not stand; and men of established reputation in science said that success in a bronze statue according to the model was a physical impossibility. Mr. Mills however resolved to have the statue cast. He applied to several large founderies in Pennsylvania, but ascertained that there was not one large enough to execute the work. He therefore built a foundry himself on an entirely original plan, with neither chimney, smoke stack, nor draft of any kind. It was not only declared utterly unfit for the purpose, but absolutely ridiculed. Mr. Mills tested it, however, and found that with comparatively little fuel he could generate the most intense heat. Having thus triumphed over formidable difficulties, he could find no workmen who understood casting so large a mass as his statue, and had therefore to learn the practical business of casting himself. After numerous trials, interrupted by unforeseen accidents, he succeeded, in Oct. 1852, in producing a perfect cast of his work. On Jan. 8, 1853, the anniversary of the battle of New Orleans, the statue was inaugurated. It stands in Lafayette square, near the president's house. It was completed at a loss of \$7,000 to Mr. Mills, but immediately after its inauguration congress made him an appropriation of \$20,000. At the same session the sum of \$50,000 was appropriated for a colossal equestrian statue of Washington, to be executed by him. The sculptor now purchased ground two miles from Washington city, where he built

a complete foundry. He there designed and executed the Washington statue upon a plan entirely different from that of Jackson. It is somewhat larger, and represents a scene in the battle of Princeton, where Washington, after vainly trying to rally his troops, puts spurs to his horse and dashes up to the cannon's mouth. The steed suddenly stops, and is in the act of recoiling, his head thrown up, and his left foot raised. This statue was inaugurated in Washington, on Feb. 22, 1860. Mr. Mills's next employment was the casting of a colossal statue of Liberty, from a design by Crawford, intended to crown the dome of the capitol.

MILLS, SAMUEL JOHN, jr., an American Congregational clergyman, born at Torrington, Conn., April 21, 1788, died at sea, June 16, 1818. His father was a Congregational minister. He entered Williams college in 1806. In Sept. 1808, a society was formed in the college whose object was stated to be "to effect, in the persons of its members, a mission or missions to the heathen;" and the first name appended to its constitution was that of Mr. Mills. This was the first foreign missionary organization in America. He was graduated in 1809, and spent some months at Yale college, partly to study theology, and partly to interest some of the students there in the cause of missions. In the spring of 1810 he entered Andover theological seminary, where he soon found others interested in the subject; and on June 28, in connection with Messrs. Judson, Nott, and Newell, he presented a memorial to the general association of Massachusetts, then in session at Bradford, stating their views and wishes, and asking advice. This memorial led directly to the formation of the American board of commissioners for foreign missions. In 1812, soon after he was licensed, he went, in company with the Rev. J. F. Schermerhorn, on a missionary tour to the southwestern states, under the combined patronage of the Connecticut and Massachusetts missionary societies. On this tour he preached and organized Bible and other religious benevolent societies. In July, 1814, he made a second tour to the same region, accompanied by the Rev. Daniel Smith. He was ordained June 21, 1815, and for the next two years passed most of the time in Albany, New York, Philadelphia, and Washington, in the promotion of the great enterprises on which his heart was set. Among the fruits of these two years' labor may be traced directly or indirectly to him the establishment of the foreign mission school at Cornwall, Conn., the organization of the American Bible society and of the united foreign missionary society, afterward merged in the American board, the first movement for city missions in New York, the establishment of a school for the education of colored preachers and teachers at Parsippany, N. J., by the synod of New York and New Jersey, and the organization of the American colonization society. Almost immediately on its organization, the colonization society sent Mr. Mills and the Rev. Ebenezer

Burgess to Africa, to select a site for a colony. They sailed first for England, Nov. 16, 1817, to confer there with the friends of African colonization, and in February following embarked at London for the African coast, where they spent two months. Having fulfilled the object of their mission, they sailed on their return voyage, May 22, 1818, and Mr. Mills died on shipboard before reaching home.—See "Memoirs of Samuel J. Mills," by the Rev. Gardiner Spring (8vo., New York, 1820).

MILLSTONE, a hard and rough stone in one or many pieces, formed into cylindrical shape, from 8 to 7 feet in diameter, and 8 to 18 inches thick, and used together with another of the same size and shape for grinding grain, &c. The lower stone is firmly fixed in its bed, and is known as the "bedder." The upper one, called the "runner," is suspended over this so as to revolve with its lower face exactly parallel to the upper face of the lower stone, and more or less close to it according to the required fineness of the flour. The grain is admitted through a hole in the centre of the upper stone from the hopper above; and as it is ground the flour escapes round the outer edges. Horizontal grooves are cut on the face of each stone, radiating from near the centre to the periphery, and one edge of these grooves is sharp and perpendicular to the face. The two stones being cut alike, when they are turned face to face these edges work against each other and crush the grain between them. The flat portions each side of the grooves are called "lands." The best millstones are made of buhrstone. (See BUHRSTONE.) They continue in use for many years, sometimes as many as 20, the edges being occasionally recut. Very hard granite is also used for millstones, and the Shawangunk sandstone has long been quarried at Esopus, N. Y., for the same purpose.

MILLSTONE GRIT, a formation of coarse white sandstone, chiefly composed of quartz pebbles, found at the base of the coal measures in the United States and also in Great Britain. Its name is derived from the use to which it has been extensively applied in the latter country. (See ANTHRACITE.)

MILMAN, HENRY HART, D.D., an English clergyman and author, born in London, Feb. 10, 1791. He is the youngest son of Sir Francis Milman, physician to George III., and was educated at Eton and at Brazenose college, Oxford, where he obtained a fellowship. His literary career commenced in 1815, with the publication of "Fazio," a tragedy performed successfully at Covent Garden; and in 1817 he took orders and was presented to the vicarage of St. Mary's, Reading. In 1818 he published "Samor, Lord of the Bright City, an Heroic Poem," founded on passages in the legendary history of Britain, which was followed in 1820 by his most successful production in verse, "The Fall of Jerusalem," a dramatic poem. In the succeeding year he was appointed professor of poetry in the university of Oxford, and pub-

lished 3 other dramatic poems, "The Martyr of Antioch," "Belshazzar," and "Anne Boleyn." After a considerable interval appeared his "Sermons at the Bampton Lecture" (8vo., 1827), followed in 1829 by a "History of the Jews" (8 vols. 18mo.), published anonymously; and in 1840 he published a collected edition of his poetical works. In the same year he produced one of his most elaborate works, a "History of Christianity from the Birth of Christ to the Abolition of Paganism in the Roman Empire" (8 vols. 8vo.), and in 1854-'7 a "History of Latin Christianity, including that of the Popes, to the Pontificate of Nicholas V." (6 vols. 8vo.), which is designed as a continuation of the former, although it is also a complete work. He has prepared a sumptuously printed and illustrated edition of Horace (8vo., 1849), with a life of the poet and criticisms on his writings, and an annotated edition of Gibbon's "Decline and Fall of the Roman Empire," preceded by a life of the historian. Numerous articles attributed to his pen have appeared in the "Quarterly Review." He at present holds the office of dean of St. Paul's, to which he was preferred in 1849.

MILNE, WILLIAM, an English missionary, born in the latter part of the last century, died in China in 1822. In 1818 he visited China, under the auspices of the London missionary society, and during the next two years travelled extensively through that country, Malacca, and the chief islands of the Indian archipelago, distributing many thousand tracts and Testaments among the natives. He subsequently established himself in Malacca, and founded a missionary station, which became one of the most important in eastern Asia. He continued to circulate the Scriptures, and also superintended the publication of religious works and of a monthly magazine. In 1817 he was again in China, where he projected the plan of an Anglo-Chinese college, aided in translating the Old Testament into Chinese, and originated the "Indo-Chinese Gleaner," a quarterly publication. He died in the midst of his labors. He is the author of a "Retrospect of the Protestant Mission to China."

MILNE-EDWARDS, HENRI, a French physician and naturalist, born in Bruges, Belgium, in 1800. He studied medicine in Paris, and devoted himself principally to physiological pursuits. After occupying the chair of natural history at the lyceum of Henry IV., he was intrusted with similar duties at the museum and the faculty of sciences, of which he is at present dean. In 1838 he succeeded Cuvier in the anatomical and zoological section of the academy of sciences. His publications comprise "Anatomical Researches concerning the Crustacea" (1828), for which he received a prize from the academy of sciences; "Manual of Materia Medica" (1832); "New Formulary of Practice for Hospitals" (4th ed., 1840); "Course of Natural History" (1834), in conjunction with Achille Comte; "Elements of Zoology" (1834-'5), re-

vised and republished in 1851 under the title of "Elementary Course of Zoology;" "Natural History of the Crustacea" (8 vols. 8vo., 1837-'41); "Lessons on the Physiology and Comparative Anatomy of Man and Animals" (1855-'7); a new edition of De Lamarck's "Natural History of the Invertebrata" (11 vols. 8vo., 1836-'45); and numerous articles contributed to scientific periodicals and cyclopædias.

MILNER, JOHN, an English Roman Catholic divine and antiquary, born in London in 1752, died at Wolverhampton in 1826. He completed his education at Douai, and was appointed pastor of a Roman Catholic congregation at Winchester. In 1790 he was admitted a member of the royal society of antiquaries, and in 1808 was created vicar apostolic of the midland district, with the title of bishop of Castabala. His most important works are: "The End of Religious Controversy;" "History, Civil and Ecclesiastical, and Survey of the Antiquities of Winchester;" and "Treatise on the Ecclesiastical Architecture of England during the Middle Ages."

MILNER, JOSEPH, an English divine and historian, born near Leeds, Jan. 2, 1744, died in Hull, Nov. 15, 1797. He was graduated at Catharine hall, Cambridge, in 1766, and after taking orders became head master of the grammar school and lecturer of the principal church of Hull. The most important of his works is his "History of the Church of Christ from its Foundation to the 18th Century" (8 vols. 8vo., London, 1794). It was continued by his brother to the reformation. A complete edition of his works, with an account of his life, was published by his brother in 1810, in 8 vols. 8vo.—ISAAC, brother of the preceding, born near Leeds in 1751, died in London, April 1, 1820. On the death of his father he left school, and worked for a time in a factory; but his brother, on being appointed head master of the grammar school at Hull, employed him as an assistant. In 1770 he entered Queen's college, Cambridge, where in 1774 he became senior wrangler, and in 1775 was elected a fellow. In 1788 he was named Jacksonian professor of experimental philosophy, in 1788 became master of Queen's college, and in 1791 was created dean of Carlisle. At Cambridge he formed an intimacy with William Wilberforce which endured through life, and he died in his house. His principal works are: a continuation of his brother's "History of the Church of Christ;" "Animadversions on Dr. Haweis's Church History;" "Essay on Human Liberty," and 2 volumes of "Sermons."

MILNES, RICHARD MONKTON, an English author and statesman, born in Yorkshire in 1809. He was graduated at the university of Cambridge in 1831, and subsequently made a tour in southern Europe, and wrote "Memoirs of a Tour in Greece," published in 1834. In 1837 he entered parliament as member for Pontefract, which constituency he still continues to represent. As a legislator he has pursued an independent course, although his politics incline to those of the liberal conservative

party. He has advocated popular education, religious equality, and measures for the reformation of criminals, and has proved himself a warm friend of the people of Italy in their struggles for independence. He has written 4 volumes of poems marked by taste and fluency of diction, entitled "Poems of Many Years," "Memorials of Many Scenes," "Poems Legendary and Historical," and "Palm Leaves: Eastern Poems;" and is the author of an appreciative and judicious memoir of John Keats, whose letters and literary remains he edited in 1848. He has also published several pamphlets and speeches on political topics, including "Thoughts on Party Politics," "Real Union of England and Ireland," "Events of 1848, especially in their relation to Great Britain," &c., and has contributed articles to the "Westminster Review" and other periodicals.

MILNOR, JAMES, D.D., an American clergyman, born in Philadelphia, June 20, 1778, died in New York, April 8, 1844. After spending a brief period at the university of Pennsylvania, he began the study of law in his native city in 1789, was admitted to the bar in 1794, and practised his profession at Norristown till 1797, when he removed to Philadelphia, where he served in several public stations. In 1810 he became a representative in congress, where he opposed the war of 1812 with zeal and ability. The parents of Mr. Milnor belonged to the society of Friends; but having married a lady belonging to the Episcopal church, and being desirous of devoting himself to the preaching of the gospel, he prepared himself for the ministry of the Episcopal church, and was ordained by Bishop White, Aug. 14, 1814. Having served in Philadelphia for a year, he was called in 1816 to St. George's church, New York, where he remained till the close of his life. Dr. Milnor's labors were abundant, not only in the discharge of his parish duties, but also in connection with the American Bible and Tract societies, and other philanthropic and charitable institutions in New York; and he has left behind him the memory of a man who possessed excellent sense and sound judgment. A few occasional sermons and addresses are all of Dr. Milnor's writings that were committed to the press.—See "Memoirs of the Life of James Milnor," by the Rev. J. S. Stone, D.D. (8vo., New York, 1848).

MILO (anc. *Melos*), an island of volcanic formation in the Grecian archipelago, and one of the Cyclades, belonging to the kingdom of Greece, lying about 65 m. E. from the coast of the Morea, in lat. 36° 40' N., long. 24° 28' E.; length 14 m., breadth 8 m.; area, 65 sq. m.; pop. about 4,000. It has on its N. coast one of the best harbors in the Levant. The soil of the valleys is fertile, producing corn, cotton, fruit, oil, and wine. There are hot mineral springs, and mines of sulphur, vitriol, and alum. Mt. St. Elias is about 2,500 feet above the sea. Milo, the capital, now almost depopulated, is situated on the E. coast, near the site of the

ancient metropolis, extensive ruins of which remain. Melos was first colonized by the Phœnicians, and afterward by the Lacedæmonians. It was rich and populous, but was ruined by the Peloponnesian war, during which the capital was captured by the Athenians, its adult males put to death, and its women and children carried off as slaves, 416 B. C. The principal relics of antiquity at Milo are tombs and subterranean vaults, some of which contain 15 or more sarcophagi. The celebrated statue of the Venus of Milo, which is at present in the Louvre, was found in 1820 in the vicinity of Milo, together with 8 statues of Hermes.

MILO, or MILOX, a Greek athlete, born in Orotona, in Magna Græcia, flourished in the latter part of the 6th century B. C. His extraordinary physical strength gave him the victory in wrestling 6 times at Olympia, and as often in the Pythian games. He is stated to have carried a 4-year-old heifer on his shoulders 4 times around the Olympic race course, and then to have eaten the whole of it in one day. In 511 he was appointed to command an army against the Sybarites. He was worsted by the agility of his adversary in his 7th Olympic struggle. Enfeebled by age, it is said, he attempted to tear asunder with his hands a forest tree partially split by wood cutters; he was caught and held fast by the closing of the fissure, and was devoured by wolves.

MILO, TITUS ANNIVS PAPINIANUS, a Roman tribune and demagogue, born at Lanuvium in the earlier part of the 1st century B. C. In 57 he filled the office of plebeian tribune. At that period Clodius, at the head of a band of desperadoes, controlled the destinies of Rome, burning temples, attacking the houses of private citizens, shedding the blood of freemen in the streets, dispersing the comitia by violence, and trampling under foot all laws. Milo, who was little better than Clodius, but desirous of retrieving his ruined fortunes by an alliance with the aristocrats, temporarily restored order, after which Cicero was recalled from exile. Clodius, who had been the author of Cicero's banishment, now assailed his person and property, and would have sacrificed him had not Milo come to his aid. The followers of Milo and Clodius now daily fought in the streets. The rival chiefs and their retainers met at Bovilla, on the Appian way, in Jan. 52, and in the fray Clodius was slain. Milo was brought to trial, and Cicero, his advocate, was so intimidated that he did not venture to deliver the oration he had prepared; his client was convicted and went into exile to Massilia, whither Cicero sent him soon after a copy of the undelivered speech. On perusing it, he is said to have exclaimed: "How fortunate it is that this oration was not delivered, for then I should have been acquitted, and have never known the delicious flavor of these Massilian mullets." Milo remained in exile till 48 B. C., when he returned to Italy to aid Marcus Cælius in resuscitating the republican party, but was defeated and slain in Lucania.

MILOSH, prince of Servia. See **ORRENOVITCH**.

MILTIADES, an Athenian general and statesman, who flourished at the beginning of the 5th century B. C. He was of a noble Athenian family, son of Cimon, and nephew of the elder Miltiades, who was prominent in Athens in the time of Pisistratus, and was also the founder of a despotism in the Thracian Chersonesus. The younger Miltiades was sent out about 516 B. C. to take possession of his uncle's inheritance. There, in order to secure his position, he imprisoned the chief men by stratagem, employed a force of mercenaries, and married the daughter of a Thracian prince. In 513 he joined Darius Hystaspes on his expedition against the Scythians, and remained with the Ionians to guard the bridge over the Danube while the Persian army advanced to the north. When the appointed time had passed, and nothing had been heard from Darius, he warmly urged the destruction of the bridge and the abandonment of the Persians, but was overruled by the Ionian leaders, who maintained their own ascendancy by Persian support alone, the feeling of the population being everywhere against them. Had his opinion prevailed, says Grote, he would thus have inflicted a more vital blow on Persia than afterward by the victory of Marathon. He remained in the Chersonese till about 498, with the exception of a brief interval during which he was obliged to retire, either in consequence of a Scythian invasion or from the temporary enmity of Darius. His only achievement during this period was the conquest of Lemnos and Imbros, which probably took place while the Persians were occupied with the Ionic revolt (between 502 and 494). He thus drew upon himself the hostility of Darius, was driven from the Chersonese at the close of the Ionic war, and on his flight to Athens narrowly escaped capture by the Phœnician fleet. He was immediately brought to trial by the Athenians for alleged despotism in his administration of the Chersonese, but was honorably acquitted, and his fame as the conqueror of Lemnos secured his election as one of the 10 generals at a time when the Persian armament under Datis and Artaphernes was known to be approaching Greece. While the generals were equally divided as to whether to meet the enemy in the field or to defend the city behind its walls, the arguments of Miltiades persuaded the polemarch Callimachus to give his casting vote in favor of immediate attack, and thus brought on the battle of Marathon. Though the other generals surrendered to him their days of command, it is said that he waited till the day of his own regular turn before he engaged the enemy, and achieved the most memorable victory in the history of Greece. The admiration of him by his countrymen was now unbounded. At his request, he was intrusted with an armament of 70 ships, placed at his sole discretion, no other man knowing its destination. He sailed against the island of Paros for the purpose of gratifying a private animosity, and ravaged the island, but failed to

capture the town. Being seized with a panic while visiting a priestess on a superstitious errand, he dangerously strained or bruised his thigh by falling, and raised the siege. On his return to Athens he was impeached and condemned to pay a penalty of 50 talents, and soon after died of his wound. According to Cornelius Nepos and Plutarch, he was imprisoned after having been fined, but this is not stated by Herodotus. The fine was afterward paid by his son Cimon.

MILTON, JOHN, an English epic poet, born in London, Dec. 9, 1608, died there, Nov. 8, 1674. His birthplace, in old Bread street, was almost beneath the bells of Bow church, within hearing of the roar of Cheapside, near the Mermaid tavern, the resort of the Elizabethan wits, and not far from old St. Paul's and the tower. His father, the son of an under-ranger in the royal forest of Shotover, Oxfordshire, had at an early age been disinherited for abandoning the Catholic faith, and had betaken himself to the profession of scrivener or copying lawyer, in which he was so successful as ultimately to retire from business with an independence. Though a serious man, and inclined to Puritanic habits, he had cultivated literature in his leisure, and was so skilled in music that he holds a respectable rank among the contemporary composers of madrigals, songs, and psalms. Milton thus not only received in boyhood the devout and dutiful training of a Puritan family, but was also taught the art and science of music, for which nature had granted him the ear and the passion, and became an accomplished organist. It is noticed that whenever in his writings he speaks of music, he is technically always strictly correct. His father secured for him the best educational advantages; and both as a boy and a man Milton was severely and constantly studious. He was still under the care of a private tutor, Thomas Young, a graduate of one of the Scotch universities, when, being scarcely 12 years old, he was sent to the school of St. Paul's, founded by Dean Colet in 1512, and then in the highest repute. His own testimony is confirmed by that of his brother Christopher, reported by Aubrey, that even at that age he seldom retired to rest from his studies till after midnight. There began his memorable friendships with Diodati and Gill, the latter just beginning his career in holy orders. He was able to compose Latin prose and verse with ease and elegance, was familiar with Greek and Hebrew, and had "no mean apprehension of the sweetness of philosophy," when at the age of 16 he was entered as a pensioner at Christ's college, Cambridge. Though destined from childhood to the church, he resolved early in his university career upon a life of continued study, with no professional aim whatever, but with a view to the ultimate display of his powers in authorship. "For 7 years," he says, "I studied the learning and arts wont to be taught, far from all vice, and approved of all good men, even till having taken

what they call the master's degree, and that with praise." It is certain, however, that he led a life of singular intellectual independence, that he did not conceal his disinclination to the scholastic sciences that were still in vogue, that a certain haughtiness of manner and obstinacy of temper made him sometimes unpopular within his college, and that he was for a period at variance with the authorities, and incurred the sentence of rustication. There is not sufficient evidence for the supposition of Dr. Johnson that he was one of the last students in either university who suffered the public indignity of corporal correction. His disgrace must have been brief, since he took both degrees at the regular times. Though in his range of study he broke from the bondage of the mediæval *trivium* and *quadrivium*, yet his Latin prolusions and elegies gave a new interest to the university ceremonies, and redounded to the credit of master and fellows. A solemn and almost austere demeanor, a conviction of superior powers, a conscious devotion to great and noble things, and a singular moral fastidiousness marked his character. His personal beauty is uniformly mentioned by those who describe his youth as very remarkable. His light brown hair, parted in the middle, fell in curls upon his shoulders; the expression of his clear gray eyes was serene and thoughtful; and, though he excelled in manly exercises, his fair complexion, slight figure, and innocent life caused him to be styled by his fellow collegians "the lady of Christ's." On quitting the university in 1632, he took up his abode in the village of Horton, Buckinghamshire, whither his father had retired from London. There he spent the next 5 years in "a ceaseless round of study and reading," varied only by occasional visits to the metropolis for the purpose of procuring books or taking lessons in music and mathematics. He stored his mind with the noblest passages in the ancient and the Italian classics, and the minute accuracy of his scholarship is proved by his marginal notes on Euripides, while both his prose and verse abound in demonstrations of the great range and variety of his learning. In this happy interval between the enforced studies of the university and the duties of public life, he wrote his exquisite minor poems, the "Sonnet to the Nightingale," the companion pieces "L'Allegro" and "Il Penseroso," the masques of "Arcades" and "Comus," and the elegy of "Lycidas." None of his other compositions are so tranquil and happy in tone, or indicate so distinctly his love of the lighter graces of poetry. They are replete with rural imagery, delicate fancies, playful allusions, and sensuous descriptions. His massive and austere character abnegated in thought and life the passions incident to the poetical temperament, and they appear in his poems only when transmuted into a pure essence. He illustrates the diviner and grander parts of our nature rather than its human frailties. There is little humor and no love even in the polished pro-

ductions of his studious leisure at Horton, which are constantly pervaded by the intellectual greatness, the vastness of conception, the remote associations, and the exquisite choice of language that mark more decisively his later writings. The themes, the fancies, and the idyllic treatment strikingly contrast with the poems which he produced after 20 years of conflict in public life. On the death of his mother in 1637 he obtained his father's permission to fulfill a cherished project of travel on the continent, especially in Italy; and he set out in the following year as an English gentleman, furnished with letters of introduction, and attended by his own servant. In Paris he was welcomed by the English ambassador and introduced to Grotius; in Florence he remained 2 months, and was received into the literary academies, before which, according to the custom, he gave evidence of his learning, and recited some of his Latin poems and 8 Italian sonnets, which won the encomiums of Italian wits and scholars; in Rome he made another stay of 2 months, protected by Lucas Holstein, the librarian of the Vatican, and by Cardinal Barberini, and chiefly delighted by several opportunities of hearing Leonora Baroni sing; and in Naples he became acquainted with the venerable Giovanni Battista Manso, marquis of Villa, the friend and biographer of Torquato Tasso, who accompanied him to the viceroy's palace and other places of interest, and apologized for showing no further attentions because his guest spoke with so little reserve on matters of religion. He abandoned his purpose of proceeding to Sicily and Greece, and thus exploring the principal classic lands, on receiving tidings of the impending rupture between the king and people in England; since he deemed it disgraceful to be pursuing his own gratification abroad while his countrymen were contending for liberty. He returned by way of Rome, where he again remained 2 months, and, though warned of Jesuitical plots, openly "defended the reformed religion in the very metropolis of popery" without fear or molestation. He proceeded thence to Florence, crossed the Apennines to Bologna, delayed a month in Venice, whence he sent his collection of books and music by sea to London, reached Geneva by way of Verona, Milan, and Mt. St. Bernard, and taking his former route through France arrived in his native land in Aug. 1639, after an absence of 15 months. The effect of his intercourse with eminent continental scholars and authors had been to quicken his literary ambition, and to strengthen his inward prompting that by labor and intent study he might write something which mankind would not willingly let die. The fall of man had not yet occurred to him as a theme, but he had fully determined to spend his strength on a poem of the highest order, either epic or dramatic, the subject perhaps to be the legend of King Arthur, or some other in ancient British history as chronicled by Geoffrey of Monmouth. His meditations were interrupted by the civil com-

motions, and by a period of 20 years during which the literature of England was almost exclusively polemical. He consented "to lay aside his singing robes," "to leave a calm and pleasing solitariness, fed with cheerful and confident thoughts," and "to embark in a troubled sea of noises and hoarse disputes," supposing that within one or two years the storm would be appeased; but during the whole splendid and vexed era of Puritan supremacy in England, with the exception of a few sonnets, he appears only as a polemical prose writer and champion of the revolution. During his absence his father had broken up his household at Horton and made his residence with his younger son Christopher in Reading. Milton therefore hired apartments and subsequently a house in the city for himself and his library, and received his two young nephews Edward and John Phillips, sons of his sister Anne, to board with him as pupils. A few more pupils, sons of intimate friends, were afterward admitted; and while pursuing his private studies he devoted a part of his time to their education after a peculiar system of his own. He was thus occupied with studying and teaching, when the aspect of public affairs called forth his first pamphlet. The long parliament met in 1640; Laud and Strafford, respectively the upholders of despotism in church and state, were overthrown; the danger from free speech was removed; and the circumstances of the time, when the government of England was nearly as much a matter of fundamental discussion as that of France is in a revolutionary epoch, offered an invitation to thinkers. Prominent among topics of public interest was that of church reform. In the controversy on this subject Milton engaged by publishing a treatise entitled "Of Reformation, touching Church Discipline in England, and the Causes that hitherto have hindered it" (1641), a vehement attack on the episcopal form of government. In the same year Bishop Hall of Norwich, at the request of Laud, undertook a defence of episcopacy, and was answered by a combination of 5 Puritan ministers under the title of *Smectymnuus*, a word composed of the initials of their names. Archbishop Usher immediately replied to the *Smectymnuans*, and Bishop Hall published a defence of himself. Milton esteemed Usher superior to his Puritan antagonists in learning, and Hall superior to them in wit and literary talent, and anticipated the triumph of the prelates unless he came to the aid of his friends. He therefore published two pamphlets in answer to the former, entitled "Of Prelatical Episcopacy" and the "Reason of Church Government urged against Prelaty," and a tract in the form of a dialogue entitled "Animadversions" upon Bishop Hall's defence. The last drew forth an anonymous and slanderous response, attributed to a son of Bishop Hall; and the controversy was concluded by Milton's "Apology for *Smectymnuus*," in which in an eloquent self-vindication he gives an interesting account of his education, studies, and

pursuits, and a eulogy of the long parliament. The question in dispute, the divine origin and authority of episcopacy, had meantime been practically settled by the government. In 1643 he was resting from controversy, occupied with his pupils, and meditating the great poetic work to which he wished to transfer all his mental power and industry. But in the midst of civil war and of epical contemplations he contracted a marriage as singular as any in the strange series of the loves of the poets. "About Whitsuntide," says Phillips, "he took a journey into the country, nobody about him certainly knowing the reason, or that it was more than a journey of recreation. After a month's stay, home he returns a married man, who set out a bachelor; his wife being Mary, the eldest daughter of Mr. Richard Powell, then a justice of the peace of Forest Hill, near Shotover, in Oxfordshire." It appears that his father had made a formal memorandum to him of a certain sum due from Mr. Richard Powell; that the larger part of this debt was never paid; that his numerous rides to Forest Hill in quest of money had resulted only in a matrimonial engagement; that he never received a shilling of the fortune of £1,000 which was promised with his wife; and that he encountered "a mute and spiritless mate" where he had expected "an intimate and speaking help." Moreover, it was a marriage amid civil conflict between a renowned parliamentarian and a lady of a royalist family. She remained only one month with her husband, and then accepted an invitation from her family, probably suggested by herself, to go back and spend some time in the country; and at a secure distance she treated both the letters and messengers of the poet with contempt, and absolutely refused to return. The pleas suggested on her side are that she was used to company and merriment, and disliked Milton's "spare diet and hard study;" the poet's chief and singular ground of complaint was that his wife would not talk; it is probable that they simply disliked each other, and that nothing but an imprudent marriage suggested to him "the pious necessity of divorcing," even in cases that depend upon "utterless facts." Milton was not a man to tolerate an insult in so delicate a matter; and he immediately came to the conclusion that other reasons, beside those legally admitted, might be sufficient for the dissolution of the nuptial tie, and determined publicly to argue his case. With the intellectual clearness and boldness which are his special characteristics, he pushed his ideas of civil and ecclesiastical liberty into the realm of the domestic circle; and he resolutely advanced the doctrine that moral incompatibility as well as conjugal infidelity justifies divorce. It should be noticed that he does not disguise his opinion of the natural inferiority of woman. His publications on this subject are: the "Doctrine and Discipline of Divorce restored to the Good of Both Sexes from the Bondage of Common Law" (2 editions in 1644); the "Judg-

ment of Martin Bucer touching Divorce" (1644), in which he shows that a celebrated contemporary of King Edward VI. had been of the same opinion as himself; "Tetrachordon, or Expositions upon the four chief Places in Scripture which treat of Marriage or Nullities in Marriage" (1645); and "Colasterion: a Reply to a Nameless Answer against the Doctrine and Discipline of Divorce" (1645). His efforts for a change of law were a total failure, but he retained his opinions till the close of his life. The discussion of the subject which he raised was no less intolerant and impatient than that on episcopacy had been, and during its progress he was summoned to the bar of the house of lords, but was honorably dismissed. Meantime he had published his tractate "On Education," only the theoretical views of which are important, and had addressed to the parliament the noblest and most useful of his compositions in prose, the "Areopagitica, a Speech for the Liberty of Unlicensed Printing" (1644). It was a plea for the freedom in literature which he had previously maintained in civil and social life; but though it contains his finest passages of prose eloquence, it was not successful in its aim of abolishing the newly established censorship. In 1645 appeared the first edition of his poem, containing in a small volume all that had yet been written. In the same year a reconciliation was effected between him and his wife. She returned to his house, and her whole family were generously entertained by him for several months. After their departure, his abode, says Phillips, "looked again like a house of the Muses." He lived successively in the Barbican and in Holborn, and was occupied with writing his history of England. The execution of King Charles (Jan. 30, 1649) aroused throughout Europe a feeling of horror and indignation, and created a reactionary tendency even among the partisans of the revolution. To justify the event and compose the startled minds of the people, Milton wrote the "Tenure of Kings and Magistrates," published within a month after the death of the king, in which he undertook to prove that subjects have a right to depose or put to death a wicked monarch. He also published "Observations" on the articles of peace which the earl of Ormond had lately concluded in the king's name with the Irish Catholics. Upon the establishment of the commonwealth, presided over by a council, the Latin was fixed upon as the official language of intercourse with foreign states. To Milton, in view both of his scholarship and his services, was offered the position of secretary for foreign tongues; and 16 letters and other documents first published by the Camden society in 1859 confirm all previous impressions of his skill in Latin composition, and of the eloquence, energy, and dignity he gave to the political despatches of the commonwealth. He vindicated the freedom of England on the seas, protested against the persecution of the Waldenses by the duke of Savoy, and expounded to Europe the position

and policy of the new government. The *Eikon Basilike* was passing through numerous editions, and winning popular sympathy for the "royal martyr," and he therefore prepared a counteractive under the title of *Iconoclastes* (1649). Claude de Saumaise (Salmasius), one of the most distinguished contemporary scholars, was instigated by Charles II., then a refugee in Holland, to compose an elaborate defence of the inviolability of kings, and especially of royalty in England, in a treatise worthy to be submitted to the learned of Europe. The name of the author was sufficient to secure fame and extended influence to his work, and the council immediately made an order "that Mr. Milton do prepare something in answer to the book of Salmasius." This was the occasion of his first "Defence for the People of England" (1650), in which he assailed at once the philosophy and Latinity of his opponent, and surpassed him in the power of scholastic vituperation. It was deemed a triumph, and he received the thanks of the council and the congratulations of all the foreign ministers in London. His eyesight had been decaying for several years, and his physicians had informed him before he undertook this defence that total blindness was threatened. He, however, regarded the task as a sacred duty, and it hastened the malady, the "drop serene" (*gutta serena*), as it is termed in his plaintive account of it. Before 1653 he was completely blind, though his eyes were perfectly clear, and without mark, speck, or any disfigurement whatever. He had already removed to the house in Petty France, opening into St. James's park, in which he remained till the restoration, and which was afterward occupied by Hazlitt. In 1652 appeared a work entitled *Regii Sanguinis Clamor ad Cælum*, written by Dumoulin, a Frenchman resident in England, but attributed to Moore (Morus), a Scotchman resident in France, abounding in calumnious invective against Milton personally. This occasioned his *Defensio Secunda* (1654), a noble defence of his own conduct, a vindication of the parliament, and a merciless retaliation for the scurrilities of his antagonist. The dispute was prolonged by two additional pamphlets on each side. Milton continued to write many of the more important state papers until the year of the restoration, and was also occupied with his history of England, with framing a body of divinity, and perhaps with the composition of his great poem, the subject of which he had at length determined. He also opposed to the last in divers tracts and letters the return of the monarchy. During the 20 years in which he had been thus diverted from "the laureate fraternity of poets" and from "the shady places of philosophy," he had been the foremost literary champion of the principles of English liberty, then struggling for recognition. His polemical writings abound in passages of the finest declamation, marked by a peculiar majesty of diction, and by a sustained and passionate magniloquence. The political theory which he advanced was in

some respects peculiar to himself. He advocated a free commonwealth, without a sovereign or a house of lords. The government should be intrusted to a general council of ablest men, chosen by the nation, and he opposed the co-existence of any popular assembly. He would not even have the members of the council chosen directly by a popular vote, but recommended three or four "sifting and refining" processes. After the restoration, a proclamation was issued for the arrest of Milton, and two of his books were publicly burned. He lived in concealment till the passing of the act of indemnity, without his name among the exceptions, placed him in safety. His first wife had died in 1652 or 1653, leaving him 8 little girls; he married a second time in 1656, but his wife, whose memory is embalmed in one of his most beautiful sonnets, survived only 15 months; and he entered a third time into the matrimonial state after a widowhood of 8 years. The last was a marriage of convenience, arranged by a friend, because his daughters had ceased to treat him with kindness. They, however, lived in his house 5 or 6 years longer, in constant quarrel with their stepmother. Unsubdued by pain, obloquy, and blindness, amid domestic infelicities and the profligacy of the era of the comic dramatists, and witnessing the public defeat of the principles which he had represented, he meditated and dictated the poems of "Paradise Lost" and "Paradise Regained." According to Ellwood, the former was completed and the latter was commenced at Chalfont, whither Milton retired from London during the prevalence of the plague in 1665. "Paradise Lost" was sold to Samuel Simmons, bookseller, April 27, 1667, for £5 in hand, and a promise of the same sum on the sale of the first 1,800 copies of each edition, none of which was to exceed 1,500 copies. The second payment was received in 1669, the second edition was issued in 1674, the third in 1678, and in 1681 Milton's widow gave up to Simmons all her interest in the work for the sum of £8. "Paradise Regained" appeared in 1671, in the same volume with the drama of "Samson Agonistes." A second and enlarged edition of his minor poems was published in 1673. His principal later prose publications were the "History of Britain" (1670), down to the Norman conquest, containing many of the early traditions, much of which had been written before the restoration; a tract entitled "Of True Religion, Heresie, Schism, Toleration, and what best Means may be used against the Growth of Popery" (1678), in which he urges absolute toleration for all Protestant sects, but denies it to Roman Catholics; a short Latin grammar (1661); a compendium of logic (1672); and his Latin epistles and oratorical exercises in the university (1674). He left in manuscript a Latin treatise on Christian doctrine, which had been unsuccessfully offered to Elzevir for publication. Two years after his death it came into the hands of one of the English secretaries of state, by whom it was deposited in the state

paper office, where it remained unknown till 1823, when it was accidentally discovered. It was immediately translated, and edited by O. R. Sumner, D.D., afterward bishop of Winchester, and it completely establishes Milton's Arianism, which had previously been suspected from passages in "Paradise Lost." Its heterodoxy was doubtless the reason why it was first offered to a Dutch publisher, and afterward withheld from the public. In his last years he was afflicted by the gout, which, according to Aubrey, "struck in" and caused his death. He died calmly and without pain, and his remains were laid beside those of his father in the church of St. Giles, Cripplegate. After his sight failed he had been accustomed to retire at 9 o'clock at night, and lie till 4 in summer, and 5 in winter. Before rising, he often had some one to read to him or to write at his dictation. He studied till 12, with the intervention of breakfast, then exercised for an hour, dined, played on the organ or base-viol, and resumed his studies till 6, from which hour till 8 he conversed with visitors. He then had olives or something light for supper, smoked a pipe of tobacco, drank a glass of water, and went to bed. His wife, daughters, and other persons were at different times employed to read and write for him. He fancied that "his vein never happily flowed but from the autumnal equinox to the vernal," and was never satisfied with what he wrote in the other half of the year. He attended no church, belonged to no religious communion, and never had social prayers in his family. That he was somewhat haughty and overbearing, and of a severe if not choleric temper, appears from other evidence as well as from passages in his controversial writings; yet his manners were usually urbane and his conversation delightful. As an epic poet, Milton has no rival in the grandeur of his subject and the power of his style. The story of the fall of man, with its scenery of heaven, hell, chaos, and the new earth, exhibiting the daring, suffering, and ruined splendor of a rebellious archangel of surpassing energy and intellect, thwarted in heaven, triumphing over Adam and Eve in paradise, and making the earth from that time for an appointed season a field of battle between the Deity and himself, presents unbounded resources of sublimity. His two greatest creations, the characters of Satan and of Eve, the former the embodiment of intellectual audacity and unprincipled ambition, the latter essentially an abstract woman; yet with all the sweetness and fascination of personality, illustrate at once the compass and the delicacy of the poet's powers. The style of Milton is a rich mosaic. The suggestions culled from his immense reading may be traced not only in similes and metaphors, but in the very texture of his thought and expression. Yet it is also marked by a singular originality, stamped by the capacity and dignity of his own mind. A firm and solemn music pervades it, the stately order of the words has the effect of an incantation, and every line excites the idea of indefi-

nite power. More than any other author Milton combines what are usually regarded as the distinctive characteristics of ancient and modern literature. He has the classical simplicity of idea, the rude strength of conception, and he has the romantic complexity and diversity of illustration. The underlying thoughts are few; the adornments are lavish. His principal characters are among the simplest in the whole field of literature, and may be discerned as such through the profusion of superficial imagery. The Swedish poet and critic Tegner thus remarks of him: "His wonderful poem cannot be assigned a place in any of the departments which are usually regarded as the only possible ones for poetic creations. He takes at once into his great ocean the whole of the four paradisaical rivers of poetry, the epic, the lyric, the didactic, and the dramatic. The proper object of the poem is didactic, because it is designed to 'justify the ways of God to man.' It is epic by the greatness of the action and the episodes of the war in heaven. But the action itself is dramatic, both in design and execution, and the main interest from beginning to end dwells about a single great tragic character, the fallen archangel. And the poem is also lyric, not only in single passages, but in general, in its whole tone and expression. Thus then the 'Paradise Lost' forms a species by itself, without a model and as yet without a copy; but to think of rejecting it on this account would be to sacrifice the just rights of genius to the crotchets of the schools. The power with which it seizes on every mind of a deeper and more serious cast only proves the poverty of our ordinary poetic theories."—The principal biographies of Milton are those by Toland, Todd, Symmons, Dr. Johnson, Mitford, Keightley (London, 1859), and Masson (London, 1859 *et seq.*); the last is designed to be an exhaustive account of his life and times. The best edition of Milton's poetical works is Pickering's (8 vols., London, 1851), with a life by the Rev. John Mitford. Among others are those of Bishop Newton (8 vols. 4to., 1749), the first critical edition; Todd, with variorum notes (6 vols., 1801); Hawkins (4 vols., Oxford, 1824); Sir E. Brydges (6 vols., 1831); Keightley (2 vols. 8vo., 1859); and the minor poems by T. Warton (1785). The prose works were first collected by Toland (8 vols. fol., 1697), and have since been edited by Birch (2 vols., 1758) and Charles Symmons (7 vols., 1806); but the only complete edition is in Bohn's "Standard Library" (5 vols. post 8vo., 1852). A concordance to the poems by Premdergast was published in 1858 (1 vol., Madras).

MILUTINOVITCH, SIMON, a Servian poet, born in Sarayevu in Oct. 1791. He is the son of a merchant, received his education at Belgrade and Carlovitz, and from 1806 to 1813 served as a clerk in the department of state at Belgrade. During the troubles which accompanied the Servian insurrection in the following years, he led a homeless and adventurous life and after the restoration of peace found

employment in the family of Prince Milosh. Having gone to see his parents in Bessarabia, and being prevented from returning to his native country by the Greek rising in Wallachia, he accepted a pension from the Russian government, and devoted himself to literary labors. A few years later he went to Leipsic, where most of his works have appeared, and in 1827 to Montenegro, whence he returned to Servia in 1840. His principal works are: *Serbianka* (1826), a collection of heroic poems on the Servian war of independence, numerous incidents of which he had himself witnessed; *Nekolike pjesnice stare* ("Some Old Songs," 1826); *Zorica* ("Dawn," 1827); and "History of Servia in 1813-'15" (1837); beside the "Montenegrine and Herzegovinian Popular Songs," collected and edited by him in the original dialects (1837).

MILWAUKEE, a S. E. co. of Wisconsin, bounded E. by Lake Michigan; area, 240 sq. m.; pop. in 1855, 46,265. It is watered by the Milwaukee, Menomonee, and Root rivers. The surface is undulating, and the soil calcareous and fertile. The productions in 1850 were 61,147 bushels of wheat, 39,299 of Indian corn, 125,584 of oats, and 71,950 of potatoes. There were 5 flouring and grist mills, 4 tanneries, 18 newspapers, 32 churches, and 4,857 pupils attending public schools. The county is traversed by several railroads, centring at the capital, Milwaukee.

MILWAUKEE, the chief city of the state of Wisconsin, and the capital of Milwaukee co., situated on the W. shore of Lake Michigan, in lat. 43° 02' N., long. 87° 54' W., about 40 m. N. from the southern boundary of the state, and 80 m. E. from Madison; pop. in 1850, 20,061; in 1857, 45,000; in 1860, about 60,000. The lake opposite the city makes an indentation in the shore, forming a large and commodious bay, 6 m. wide and 8 m. deep, which is easy of access at all seasons of the year. The Milwaukee river, which flows through the city, and is joined near its mouth by the Menomonee, has been dredged and rendered navigable to the heart of the city by vessels of any tonnage used on the lakes. It is regarded as the best harbor on the S. or W. shore of the lake. The climate is peculiarly bracing and healthful, and the atmosphere is remarkably clear and pure. It is estimated that the mortality is less than in any other city W. of Buffalo. The city is regularly laid out. The centre, near the Milwaukee and Menomonee rivers, is the business quarter; and the E. and W. parts, the former of which is built upon a high bluff overlooking the lake, while the latter is even still more elevated, are occupied by residences. The material used in building is principally a beautiful cream-colored brick, known as Milwaukee brick. The streets, except those in the commercial quarter, are generally well shaded. The city contains, beside a court house and county buildings, 83 churches (4 Baptist, 8 Congregational, 1 Dutch Reformed, 4 Episcopal, 6 Lutheran, 6 Methodist, 2 Presbyterian, 6 Roman Catholic, and 1

Unitarian), and 2 Jewish synagogues. Beside a large number of private and select schools, there are 9 public schools, one in each ward. The value of the school property amounts to about \$150,000. The schools are graded, and the higher as well as the elementary branches of education are taught in them. They are free to all, and supported partly by the state school fund and partly by a city tax. There are also a female college and a commercial college. The city has a chamber of commerce, 8 banks, 7 insurance companies, 2 orphan asylums, a Roman Catholic convent, and a hospital under the charge of the sisters of charity, 42 hotels, and a building erected by the United States in 1857-'8 for government purposes. The last is of Illinois marble, 8 stories high and with two fronts, one of 110 and the other of 60 feet. It is occupied by a post office, custom house, U. S. district court, collector's offices, library and grand jury rooms, U. S. marshal's office, U. S. district attorney's office, &c. There are 8 daily newspapers, 4 of which are printed in English and 4 in German. The following railroads centre at Milwaukee: the Milwaukee and Chicago, 85 m. long, and running along the lake shore; the Milwaukee and Minnesota, running from Milwaukee to La Crosse on the Mississippi, 200 m.; the Milwaukee and Horicon, which when completed will connect this city with Superior City, distant 325 m.; the Detroit and Milwaukee; the Milwaukee and Watertown; the Milwaukee and Beloit; and the Milwaukee and Mississippi, connecting Milwaukee with the Mississippi river at Prairie du Chien. The main feature in the commerce of Milwaukee is its vast and yearly increasing grain trade. The following table shows the yearly shipments of wheat and flour from Milwaukee:

| Years. | Flour, bbls. | Wheat, bush. |
|-----------|--------------|--------------|
| 1851..... | 51,859 | 817,385 |
| 1852..... | 92,995 | 564,404 |
| 1853..... | 104,055 | 956,708 |
| 1854..... | 145,083 | 1,809,453 |
| 1855..... | 151,569 | 2,641,746 |
| 1856..... | 158,415 | 2,761,979 |
| 1857..... | 228,423 | 2,561,811 |
| 1858..... | 298,688 | 3,994,318 |
| 1859..... | 282,956 | 4,732,957 |

The city contains many of the best flouring mills in the West, and the reputation of several of its prominent brands of flour is excellent in the eastern and continental markets. The shipments of flour in 1859 were as follows: to Buffalo, 157,110 bbls.; to Ogdensburg, 38,892; to Canada, 54,535; to other ports, 7,775; by Detroit and Milwaukee railroad, 28,775; by Milwaukee and Chicago railroad, 869; total, 282,956. The wheat exported from Milwaukee in 1859 was destined to the following ports: to Buffalo, 2,650,517 bushels; to Oswego, 1,320,440; to Ogdensburg, 182,232; to Cleveland, 128,800; to Dunkirk, 20,300; to Canada, 841,707; to other ports, 68,748; by Detroit and Milwaukee railroad, 10,418; by Milwaukee and Chicago railroad, 20,300; total, 4,732,957. The following table gives the amount and value of flour

and grain exported from this port during the year 1859:

| | | |
|-------------|-------------------------|------------------|
| Flour..... | 282,956 bbls., @ \$5 80 | = \$1,499,686 80 |
| Wheat..... | 4,732,957 bush., " 0 98 | = 4,401,620 01 |
| Oats..... | 298,788 " " 0 39½ | = 117,999 08 |
| Corn..... | 46,073 " " 0 60 | = 27,643 80 |
| Barley..... | 62,686 " " 0 60 | = 37,631 60 |
| Rye..... | 10,867 " " 0 70 | = 7,606 90 |

Total value..... \$4,091,798 04

The provision trade of Milwaukee also promises to become second only to that in grain. The exports from this port of beef and pork in the years 1856 and 1859 were as follows, viz.: shipments of beef in 1856, 2,899 barrels—in 1859, 14,371; of pork in 1856, 11,742—in 1859, 31,661. The shipments of butter amounted in 1858 to 131,858 lbs., and in 1859 to 504,574 lbs. Five lines were engaged in 1859 in running steam freight vessels from Milwaukee to ports on the lower lakes. The number of arrivals and clearances at this port in 1858 were 2,113, and in 1859 4,638. The registered shipping in 1859 amounted to 82 vessels, including 7 steamers, with an aggregate burden of 17,735 tons. The total amount of grain and flour in store in the warehouses and elevators of the city, March 1, 1860, was 1,078,626 bushels.

MILYAS. See LYCIA.

MIMNERMUS, a Greek poet, born in Smyrna, flourished from about 634 to 600 B. C. He was a descendant of one of the colonists of that city from Colophon, whence he was generally called the Colophonian, and his remote ancestors came from the Elean Pylos. Of the fragments of his works which have come down to us, the most important is his celebrated poem of *Nanno*, the most ancient erotic elegy of Greek literature. They have been published separately by Bach (Leipsic, 1826). The best edition is by Schneidewin, in the *Delectus Poetarum Elegiacorum Græcorum* (Göttingen, 1838).

MIMOSA. See SENSITIVE PLANT.

MINA BIRD (*gracula religiosa*, Linn.), a conirostral bird of the starling family and subfamily *graculina*. In this genus the bill is as long as the head, broad at the base and strong, with the culmen curved, sides compressed and nearly straight, and tip slightly notched; nostrils partially covered by the frontal plumes; wings long, with the 1st quill rudimental, and the 2d shorter than the 8d and 4th, which are longest; tail short and nearly even; tarsi shorter than the middle toe, stout, and covered with strong scales; toes long, the outer the longest, and the hind one very long and strong; claws curved and robust; some parts of the head are naked or carunculated. This species, the best known of the genus, is about 10½ inches long, of which the tail is 3, and the expanse of wings 19 inches; the body is round and plump; the color is velvet black, with green, blue, and purple reflections; on the wings is a white speculum; the bill, feet, and caruncles behind the eyes, yellow. It is found in Java, Sumatra, and other islands of the East Indian archipelago, inhabiting the jungles, where it is seen in pairs or small parties in the tops of lofty trees, searching

for fruits, berries, and insects. It is easily domesticated, and becomes very familiar; it soon learns to whistle, sing, and talk, imitating the human voice, according to Latham, more nearly than any other bird; it is frequently kept as a cage bird in the East Indies, and sometimes in Europe and in this country, where as much as \$100 has not unfrequently been paid for a single bird. Another species, with similar habits, is the musical grackle (*G. musica*, Temm.), found also in the East Indies; and a few others are described, all from the Indian archipelago.

MINAS GERAES, the most elevated province of Brazil, lying between lat. 14° 20' and 22° 50' S. and long. 40° 27' and 51° W., bounded N. by Bahia, E. by Bahia and Espiritu Santo, S. by Rio de Janeiro and São Paulo, and W. by Goyaz; area, 223,500 sq. m.; pop. in 1856, 1,300,000. It occupies a plateau which is traversed by detached mountain ranges, separated from each other by spacious pastoral valleys. The loftiest of its summits are Itacolomi (about 5,700 feet) and Itambi (about 6,000 feet). The principal rivers are the San Francisco, the Rio Grande do Sul, Rio Parnahiba, Rio Doce, and Jequitinhonha. The climate, owing to the great elevation of the province, is mild and healthful, save in the low alluvial districts adjoining the large rivers. The soil is in general very fertile, yielding in abundance and with little labor grain, fruits, cotton, tobacco, sugar, maize, manioc, coffee, indigo, ipecacuanha, jalap, liquorice, &c. The annual produce of Paraguay tea is about 20,000 lbs. of a superior quality. The forests are extensive and valuable; and the country abounds in horned cattle and swine. The great sources of wealth, however, are the minerals, among which are gold, silver, copper, platinum, iron, lead, mercury, antimony, bismuth, alum, sulphur, limestone, and millstone. Some of the most famous diamond districts are in this province. It possesses extensive iron works, the largest of which are near Ouro Preto, but no other manufactures of any importance. Minas Geraes sends 20 deputies and 10 senators to the imperial legislature, and has a provincial assembly of 36 members for the management of its own public affairs. It has made the greatest progress in education of any of the Brazilian provinces. Capital, Ouro Preto.

MINATITLAN, a small town on the W. bank of the river Coatzacoalcos, isthmus of Tehuantepec, Mexico, 20 m. from its mouth; pop. 460. It is the head of ship navigation on the Coatzacoalcos, and has obtained some notoriety and importance from being the Atlantic point of departure in the various attempts to establish an interoceanic communication by way of the isthmus of Tehuantepec. It is also the proposed terminus of the projected railway across that isthmus on the N. The country immediately around the town is low and subject to periodical inundations. Its trade is small and its industry limited. Cattle constitute the chief wealth of the people. A few cargoes of mahogany and other woods are shipped annually.

MINCIO (anc. *Mincius*), a river of N. Italy, which runs, under the name of Sarca, from the S. extremity of the Tyrol into the lake of Garda, at Riva, issues from it at Peschiera, when it takes the name of Mincio, and flowing southward, forms the boundary between the districts of Verona and Mantua; then, past Goita, turning S. E. it expands into a lake, near the E. end of which the fortress of Mantua stands; below which, contracting again, it discharges itself into the Po, near Governolo, after a course of over 40 m. It is navigable for barges throughout the greater part of its length.—The Mincio has been immortalized by Virgil, who dwelt on its banks. A battle was fought there in 197 B. C., in which the Insubres and Cenomani were defeated by the Romans. At a subsequent period the celebrated interview was held in a place on the Mincio between Pope Leo I. and Attila, which resulted in the withdrawal of the Hunnish forces from Italy. Bonaparte crossed the Mincio, May 27, 1796; and the Austrians under Bellegarde were defeated there by Brune, Dec. 25 and 26, 1800, and upward of 4,000 of them taken prisoners. Another victory over the Austrians was achieved there by the French under Eugène Beauharnais, Feb. 8, 1814, after a bloody conflict and severe losses on both sides. In 1859 the Mincio became again the theatre of war between the allied Sardinians and French and the Austrians, the latter endeavoring to concentrate their resistance on the line of the Mincio. After the battle of Solferino (June 24), the allied armies crossed the Mincio into Venetia, and the war was brought to a close by the peace of Villafranca (July 11), by which Lombardy was wrested from Austria, to be transferred to Sardinia, and the upper Mincio became a part of the boundary between the two states.

MIND, **GOTTFRIED**, a Swiss artist, better known under the name of Berner Friedli, born in Bern in 1768, died there, Nov. 7, 1814. A German landscape painter named Legel instructed him in his art, and the poor boy entered afterward the charity school of Pestalozzi, where he devoted himself exclusively to the study of design. Ignorant in all other branches of education, and ill-formed bodily, he shunned society and spent his life among cats, of which he executed such excellent pictures that he was called the Raphael of cats. He also excelled in pictures of bears, of children, and beggars. He died in the most abject poverty. Since his death his pictures have commanded extravagant prices.

MINDANAO. See **PHILIPPINE ISLANDS**.

MINDEN, a strongly fortified Prussian town (pop. about 12,000), capital of the administrative division of Minden (pop. 500,000), on the left bank of the Weser and on the declivity of a chain of mountains, 161 m. from Cologne and 229 m. by railway from Berlin. It has manufactures of woollens, linens, tobacco, soap, and sugar, and is the centre of the Cologne-Berlin railway, which, as well as the navigation of the Weser, produces much commercial activity. It

possesses an ancient Roman Catholic cathedral, and was once the capital of the see of Minden, which was founded by Charlemagne. It was also formerly the residence of some of the German emperors, and several diets were held there. Within 2 m. of Minden the railroad traverses the pass called Porta Westphalica. In a ruined chapel near it Wittekind was, according to tradition, baptized by Charlemagne. The French were defeated in the vicinity of Minden, Aug. 1, 1759, by an Anglo-Hanoverian army under Ferdinand of Brunswick.

MINDORO. See PHILIPPINE ISLANDS.

MINE (Fr. *mine*, a mine or ore), an excavation made in the earth for the extraction of ores, coal, salt or other minerals. If the object of the exploration is a rock of any kind, as limestone, marble, any sort of building stone, or slate, the excavation is known as a quarry. Mines of coal are treated in the article **COLLIERY**. Many metallic mines, with their treatment in ancient and modern times, are described in the articles on the several metals; and little need be added here of the accounts which have come down to us of the mines worked by the ancient Egyptians, Greeks, and Romans. Diodorus Siculus gives a more minute account of the mining processes of the Egyptians under the Ptolemies than we possess of any other ancient people. To the working of the gold mines upon the confines of Egypt criminals and prisoners of war were condemned, whole families together, and kept in continual servitude under cruel taskmasters and barbarian guards, that understood not the language of their prisoners. He describes their method of softening the gold-bearing rock by means of fires and of breaking it with iron picks, and their following the shining veins below the surface in dark winding passages, through which they were guided by lamps attached to their foreheads. Children, adults, and old people of both sexes were all condemned alike to the various operations of the mines; some extracting the ore, others removing it to those who crushed it into small pieces, and others grinding it in hand mills to powder. By others the earthy matters were washed away from the metallic particles upon broad tables a little inclined; and the smelters finally purified the ores by fire in earthen crucibles with suitable fluxes. From the earliest times the extraction of the mineral treasures stored in the rocks had been an object of great interest to man. Of some ancient races the chief records we possess are their mining explorations. In the article **COPPER** reference is made to the numerous mines of an unknown period recently discovered in the copper region of Lake Superior; and others of similar character have been met with in the copper and silver districts of New Mexico. While the implements employed by the workmen of these ancient mines were only rude hammers of stone, indicating but little progress in the mechanical arts, the immense amount of labor bestowed upon these and upon the work of ex-

tracting the metallic products showed the high value which an ignorant race set upon the metals. As mankind advanced in the arts and in civilization, new properties and uses of minerals were frequently discovered, till mining has grown to be one of the chief industrial pursuits of man. In tracing the veins of the ores he has been led successively on from the shallow pits of the ancients to greater and greater depths, overcoming with increasing mechanical skill and superior appliances the increasing difficulties of drainage, ventilation, and artificial illumination, till his works have been carried to depths exceeding 2,500 feet below the surface, and extending several miles in horizontal directions. As mines were worked in ancient times, and are yet among barbarous nations, the applications of labor-saving machinery are few and exceedingly rude. The rock through which the shafts are sunk and the horizontal galleries are driven is slowly broken off, sometimes by the aid of fires kept burning against it, and the fragments are laboriously brought to the surface upon the heads or shoulders of the workmen, who climb by insecure steps cut in the slopes, or by ladders formed of single logs with sticks for rounds inserted in their sides. Even the water which flows in is sometimes removed in the same way, or drawn out by hand. The simple windlass was a great invention for the miner, and is now universally in use for the sinking of shafts to moderate depths, and even for prosecuting mining operations to some extent. For heavier work the horse whim has been introduced in modern times; this is a drum attached to a vertical axle and carried around by one or several horses secured to its horizontal arms. Around the drum, which corresponds to the barrel of the windlass, the rope is wound, the ends of which pass over pulleys and down the shaft, supporting the buckets in which the water, ores, &c., are drawn up. Where water power was conveniently at hand, this has been used for the same purposes. With the invention of the steam engine more efficient machines of various kinds were brought into use; and when this was applied to mining purposes in 1765 by Watt in Cornwall, it was soon found that much more powerful hydraulic apparatus could be used than was ever before applied to mining, and large pumps with heavy cast iron pipes, capable of supporting a pressure of a column of water several hundred feet high, were substituted for the clumsy wooden pumps that had been previously in use. Thus the means were afforded of carrying the workings to greater depths than were ever before reached, and of raising to the surface the immense bodies of water that continually collect in deep excavations, as also of vastly larger quantities of ores and the materials removed in searching for them. The large transportation of the products of coal mines led to the invention of railways, which, constructed of wood, were laid from the mouths of the shafts at the collieries in the north of England down to the

places of shipment, and were in use for about 200 years before they were applied to other purposes. More recently introduced in the long levels of the mines, the tracks of wooden or iron rails have greatly added to the facilities of removing the excavated materials. While in this direction the mining art has been greatly advanced by modern improvements, the facilities of breaking rock from its solid bed have been but little increased since gunpowder was first applied to this purpose in the early part of the 17th century, as noticed in the article **BLASTING**. To the present day the method of penetrating the solid rock is exceedingly slow and laborious. Except where sufficiently soft to be worked out by the pick, it is drilled in holes of an inch to $2\frac{1}{4}$ inches diameter, to the depth of 2 to 4 feet at a time, and the holes charged with powder are fired, breaking away as much rock as may be. In the long narrow passages of mines, often poorly ventilated, the smoke of the powder after blasting long keeps the men from their work, and envelopes them a great part of the time in an unhealthy atmosphere. The air is further vitiated by the numerous lamps and candles required for light, and also by the breathing of the men and the horses or mules which are employed in large mines. Its temperature also is raised by the same causes, as well as by the general increase of heat with increasing depth. Ventilation is therefore a matter of the first necessity, and is provided for in all mines by the arrangement of the shafts and levels, so as to secure a downward current of air through the lower openings, and an ascending current through the shafts, at the mouths of which chimneys are sometimes raised to increase the draft. In collieries, where noxious and explosive gases are generated, and thorough and rapid ventilation is all-important for the safety of the workmen, fires are kept burning at the bottom or top of the "upcast" shafts, by which a powerful draft is created and currents of air are drawn along through distant parts of the mine. Revolving fans and other machines are also employed to drive the air through the passages. (See **BLOWING MACHINES**.) —The mineral treasures of the earth are found not scattered indiscriminately in any country or in any rock formation, but mostly limited to certain groups of rock, and usually to certain districts, which acquire the name of mining districts. The discovery of a valuable mine in any long settled country out of one of these districts may always be regarded as extremely improbable. The ores occur in beds contained between the strata of rock, in veins which cross these, and in other forms (see **MINERAL VEIN**); and they are also met with in deposits among the gravel and sands of the beds of existing rivers and the more ancient diluvium, as gold and tin. Their presence is indicated by the finding of loose pieces upon the surface and of particles in the solid rocks, which may be sufficiently promising to lead to the exploration of the locality by blasting the rock in search of a con-

tinuous vein or bed; but as these are more commonly hidden beneath the soil, they are usually sought for by other means. The lead miner at the West is guided by depressed lines upon the surface, which indicate the existence of fissures in the limestone that contain the object of his search, and he sinks along these his "prospecting" shafts. In other districts the more usual practice is to dig long pits at right angles to the prevailing course of the veins of the district, carrying them down to the rock with the view of exposing one of the veins wherever this may be crossed. This method is called by the Cornish miners "costeening." If the veins or beds lie at a gentle inclination, they may be cut by boring, a method better adapted for discovering coal beds than mineral veins. The surest mode of finding veins is by horizontal adits or cross cuts, at right angles with their course, driven into the sides of hills; this method is resorted to where the prospect of striking veins is very certain, and the hill rises high above the adit. The passage thus made continues to be used, while the mine is worked, as a road for bringing out the materials and as a drain for the waters. In mining districts that have been long worked explorations for new discoveries are mostly conducted underground in the old mines, as by driving cross cuts in search of new veins likely to be found parallel with the old, or by extending the works upon these from the places where they were abandoned as unprofitable. A vein being discovered upon the surface, the method of commencing mining operations varies according to its character and that of the ground. A shaft may be carried down upon it for the sake of proving its quality; but as veins are rarely vertical, and their dip or "underlay" is seldom at a uniform slope, a shaft of this character will not be convenient for permanent work; and therefore, as soon as the vein is found to be worthy of the expenditure, a vertical shaft is commenced at some distance in front of the outcrop, so as to strike the vein at a considerable depth. As soon as possible an adit should be commenced from the lowest point from which it can conveniently reach the vein at or near the shaft; and in some situations, as at the base of steep hills, this may be made the principal feature of the mine, until, the vein being worked out above its level, the explorations are continued below. In some situations several adits may succeed each other at different levels down the slope of a long hill. The shaft is usually oblong (sometimes round), and may measure 6 feet by 4, 6 by 8, or 8 by 10 feet, or even larger, according to the purpose for which it is intended. The largest are partitioned off, so as to afford one compartment for the pumps, another for the hoisting, and it may be a third for the ladder ways. But as the shafts increase in number in the course of mining, separate ones often come to be appropriated to these special purposes. The sides of the shafts are protected from the falling in of loose materials by timbering, which in the case of quicksands and wet ground requires

to be constructed of great strength and closeness. As the shaft is carried vertically down it reaches nearer and nearer to the vein which dips toward it, and at any point a level may be driven across to meet the vein. This is usually done at the level of the adit, and at every 10 fathoms, or 60 feet, below; and after the shaft has reached the vein and been carried through it, the same system is continued, the direction of the cross cuts being reversed as the shaft has passed to the other side of the vein. The length of these cross cuts, it is apparent, now increases as the shaft gets further and further away from the plane of the vein. When the vein is struck by the shaft, the sinking is often carried down its slope, and the vertical shaft is at any time afterward continued. At the points where the vein is reached by the cross cuts and shaft, levels are driven along its course in each direction. They are parallel roads on the vein, succeeding each other at about every 40 feet in depth. To secure ventilation, small inclined shafts called winzes are sunk at any convenient distance, from 100 to 200 feet, along the levels, connecting each of these with the level above or below. By means of this work, which is all preparatory and not done for the sake of taking out ore, the vein is penetrated and explored in both directions along its course and also in depth. As it goes on, an idea is afforded of the productiveness of the mine, and the plan is varied according as the vein is found poor in certain places and rich in others. The expense of thus "opening a mine" before the work begins to be profitable is often very great, being rarely less than \$20,000, and sometimes reaching 10 or 20 times this amount. It is a venture of no little hazard, both from the uncertainty of the character of mineral veins and of the expenses which are to be incurred. The enterprises therefore are commonly conducted by companies, and the miners themselves often take a share of the risks. When in the opening of the mine sufficient room has been made for men to work to advantage in taking down the richer portions of the vein without interfering with others engaged in extending the levels and sinking the shafts and winzes, the "stopping" is commenced along the "backs" or portions of the vein extending up from the levels. This work is so named from its being carried on in successive steps or stopes, one set of men breaking down 6, 10, or 12 feet in height above the level, and going forward with this, while another follows, taking down the next 6, 10, or 12 feet above, and so on. The men are supported upon a platform resting on stulls, which are timbers whose ends are inserted in the opposite walls of the vein. The ore, as it is broken down, is allowed to fall to the floor of the level, whence it is run out in wagons or wheelbarrows to the shaft, and is then shovelled into the "kibbles" or iron buckets to be hoisted to the surface. The worthless stones which form a considerable part of the contents of veins are left as much as possible

upon the stulls. They serve to fill up the vacant space between the walls, and where the vein lies at a gentle slope they sustain the "hanging wall" from settling down upon the "foot wall." Unproductive parts of the vein are also left standing for the same purpose; and sometimes it is found necessary to build arch work in stone or brick masonry, and upon this the waste is piled instead of upon stulls. By this method, distinguished as "overhand stoping," a great advantage is gained in avoiding unnecessary raising and moving of the ore and rubbish, as in the other method, called "underhand stoping." By the latter the stopes are carried along the floor of the levels, one set of hands following another. This work may be sooner commenced in a mine, but it is objectionable, not only for the reason given, but also for the greater uncertainty of the character of the "ground," or vein, to be encountered, and the consequent inability to lay out beforehand the portions that may most advantageously be left standing and those which are most valuable to remove. In underhand stoping also the men are likely to be troubled by the flowing in of water upon their work. As the levels are carried far away from the shaft, the difficulties of getting the ore out and ventilating the mine render it necessary to sink again on the course of the vein on one or both sides of the original shaft; and the character of the vein being now understood, it may be found most judicious to sink the new shafts so as to cut the vein at a much greater depth than at first. To expedite this work, which in hard rock is exceedingly slow, sometimes not exceeding 2 or 3 feet in a week, though pushed day and night by as many men as can work in the limited space, surveys are made with extreme care through the intricate passages of the mine; and by the levels and cross cuts, some of which are extended for the purpose, the position of the proposed shaft is exactly defined at the different levels, and sets of men are placed to sink or to rise at each one of these. This work is well done, if when a deep shaft is thus completed daylight can be seen in looking up from the bottom. A shaft 1,224 feet deep was finished within one year in the consolidated mines of Cornwall by being worked on this plan from 15 different points. As mines continue to be worked, they are thus constantly extending in length and in depth also, until the increased cost of raising the water and ores equals the value of the products. Branch veins coming in at the sides often afford a new field for operations, and cross cuts are frequently driven off for the purpose of exploring the "country," as the miners call the solid rock outside the vein. Mines become poor and are abandoned, and other companies afterward return to them and make or sink fortunes anew; and thus in old mining districts, like Cornwall, they have been worked for hundreds of years. In that region the greatest depth attained is at the Tresavean copper mine near Redruth, which is 2,112 feet deep below the surface, or 1,920 be-

low the adit level, from which, on account of the varying level of the surface, the depth of mines is properly estimated. Its depth below the level of the sea is about 1,700 feet. On the continent of Europe some of the mines are still deeper. The deepest now worked in the world is a silver and lead mine at Andreasberg in the Hartz mountains, which has reached the depth of 2,500 feet. (See HARTZ.) At Kuttenberg in Bohemia is an abandoned mine in which the depth of 3,778 feet was reached. In the United States few if any mines yet exceed 800 feet in depth; this has been reached at the coal mines near Richmond, Va., and some of the anthracite mines of Pennsylvania and of the Lake Superior copper mines are fast approaching the same depth.—The keeping of deep mines free from water and raising their products to the surface requires steam engines of great power, and the cost of fuel becomes a heavy item in mining expenses. In Cornwall the plan has been adopted since 1812 of recording and publishing the amount of work done by the engines and the fuel consumed. The result is termed the "duty," and is estimated by the number of pounds weight raised a foot high for one bushel of coal of 94 lbs. consumed. By reason of the attention thus directed to the subject, the working of the steam engines has been continually made more and more economical, while they have also been vastly increased in size, till some of the most powerful and efficient engines in the world are those of the Cornish mines. The largest are from 80 to 90 inch cylinders, and they are usually run but about 6 or 7 strokes a minute. In the last century the duty of the old atmospheric engine was rated at 5,500,000 lbs. raised a foot high for each bushel of coal. This was increased by Smeaton's improvements to 9,500,000 lbs. Watt raised the duty by 1815 to 20,000,000, and this has since gradually increased till the average duty of the best Cornish engines exceeds 100,000,000 lbs., and has for a single engine reached 110,000,000. The great work of the engines is in pumping water up to the adits, through the largest of which great streams are continually flowing toward the sea. (See ADIT.) At a single mine called Huel Abraham 43,500 hogsheads of water have been raised every 24 hours from a depth of 1,441 feet. The working beam of the pumping engine is often seen projecting through the side of the engine house, and to it are suspended the pump rods, which pass directly down into the shaft. The pumps are arranged in sets of 100 to 200 feet lift each, the lower ones discharging into reservoirs excavated in the rock, from which the next set above receives its supply. The reservoirs are arranged to catch as much as possible of the water flowing down to their level, that it may not have to be raised from greater depths. In sinking a shaft the lowest pump is always a lifting pump, while the others are forcing pumps. The lifting pump is usually provided with one sliding length of pipe, so as to keep settling down as the rock is blasted away

in the bottom of the shaft, and new lengths of pipe are added as required. The pump rods of the forcing pumps are of very stiff wood about 4 inches square, the lengths strongly spliced and strapped together. To relieve the engine of their immense weight, which in very deep mines would be too great for the wood itself, they are counterpoised at intervals down the shafts by what are called "balance bobs," being horizontal vibrating beams, placed in chambers hollowed out of the rock by the side of the shaft, one end of the beam attached to the pump rod and the other carrying a counterpoising weight of stone.—With the increasing depth of mines the labor of the workmen in going to and returning from their work becomes at last a serious consideration. It often requires an hour of toilsome effort to reach the surface from some of the deep Cornish mines. Ladders about 25 feet long and with as many steps are supported one below another, each upon a platform, called a "sollar," through which a man-hole opens to the top of the next ladder below. A machine was contrived at the deep mines of the Hartz, and has since been introduced into Cornwall, France, Belgium, and Germany, by which the steam engine is made very ingeniously to carry the men either up or down by the vibration of the lever beam. One end of this is connected with two balance bobs, to which are hung two rods which pass down to the bottom of the shaft and move up and down with the vibration of the bobs, one rod ascending as the other descends. Upon each rod are fixed at distances 12 feet apart small platforms, large enough for a man to stand upon. At the end of each movement every platform on one rod stands on the same level with a corresponding platform on the other rod. A man standing on the one to go down is carried down the length of the stroke, say 6 feet, and finds himself opposite another platform on the other rod which had come up 6 feet as the other went down. He steps on to this, and with the next stroke goes down 6 feet again; and thus he continues to descend by stepping across from one rod to the other. In ascending he leaves each for the other at the end of its upward instead of its downward movement. One man can follow another, till there are as many men as steps on the rod. Men are also sometimes hoisted to the surface in the buckets, and in the deep coal mines in the iron cages in which the coal is brought up. This is a less expeditious way than by the "man machine," described above, and is moreover attended with greater dangers.—Although machines of great power are applied to the working of mines, it is only by the patient toil of the miners that the rock is broken away from its bed and the excavations are slowly carried forward, the total length of which in the course of years is reckoned by miles. The tools they employ are the simple boring tools described under BLASTING, and the universal pick and shovel. With the former they penetrate the crevices of the rocks, remove loose pieces,

and drive with its hammer-shaped head the gads or little iron wedges into the cracks, thus taking away the rock in fragments; when too solid for this, they bore a hole with the drills in a position to break away the rock to the best advantage, one man holding the drill and the other striking with the mallet or steel hammer. This work the miner learns to do in any direction, and while placed in most cramped positions. The effect of the blast is to throw out fragments of the rock and to "shake" it, so that much more may be removed by the pick and gad. It is often the case that between the vein and the wall rock there is a crevice filled with clay, called by the miners "flucan." This is a great assistance in removing the vein, the stone readily breaking away from it; and it is also of advantage in defining the vein, so that when this becomes poor and undistinguishable from the wall rocks, the miners may not be led off and lose it. The materials of the vein are sometimes so soft, that they are removed by the pick without blasting, and the walls themselves are sometimes in a decomposed and rotten state. While this greatly reduces the cost of excavation, it involves an outlay for timbering which is always a considerable expense in mining. In such ground the levels require, as they are carried along, to be protected from caving in. For this purpose posts are set up at the sides, and each pair are connected across the top, and sometimes across the bottom also, by horizontal pieces let in to the posts. A lining of boards or poles behind and over the frame keeps the work secure. In very bad ground this lining is driven ahead close up to the work as this goes on. Shafts are secured in a somewhat similar manner. The timbering when closely made serves to check the flow of water into the mine; and when shafts are cribbed for this purpose, much skill is required to fit the work tightly, especially in the bottom to resist the pressure of the high column of water from the level above. The cribbing is in some instances constructed in mason work in brick or stone, and occasionally in iron.—The principal mines in the United States, and indeed on the American continent, as also in many other parts of the world, are worked to great extent by English miners, chiefly from Cornwall. They bring with them a skill derived from the experience of generations of miners, and habits that prevent their being readily drawn off to other pursuits, or even introducing any changes in their methods of work, which the different conditions of the mines and country require. Improvements in these are commonly made by our own people, who, however, except in California, never are known as a class of miners like the Cornish, Irish, Welsh, and Germans. The system of labor established at the large mines is like that in Cornwall; and by this it is made the interest of the men to accomplish the greatest practicable amount of work. The sinking of shafts, driving of levels, and all underground operations which are not directed to the imme-

diate extraction of ore, are classed as "dead work" or "tut work," and the miners engaged in them are called tut workmen. They usually work by contract, taking a job to sink a shaft of given dimensions so many feet or fathoms in depth, or to drive a level so many feet or fathoms, delivering at the surface the stuff they remove. The common practice is for each party or gang of men to divide into 8 shifts, one succeeding another every 8 hours. By this plan the work is kept constantly going on, which is not the case when it is conducted by two 10 hour shifts. The men have the use of the general mining machinery for hoisting and pumping, but pay for their own powder, fuse, steel, sharpening of tools, &c.—The breaking down and extraction of the ore is the productive labor of the mine, in contradistinction to the dead work, and is to a great extent conducted by miners called "tributers," who work on tribute, that is, for a certain share of the products they can extract within a given time in the portion of the mine assigned to them. At large mines contracts of this kind are let out at regular times, called "setting days," which may be once every two months, the men collecting round the counting houses and bidding for the several jobs or "pitches," as these are put up at auction by the mining captains. By the tribute system it is made the interest of the miner to extract the greatest amount of ore at the least cost, to guard against all waste as the ore passes through the different processes of preparation for sale, and to search carefully that no rich bunches of ore escape notice and are left behind in the mine. He takes a portion of the risk of mining, being benefited if the pitch turns out better than expected, and suffering loss if the lode grows poor. The work upon the surface is generally paid for by the day, and the same is the case with some of the underground work.—It has long been the practice of different governments to reserve the mineral treasures of the lands in conveying to individuals the proprietorship of the surface; and whenever these treasures are brought to light they are either farmed out to individuals or companies, conceded as marks of special favor, or worked under the immediate direction of the government. The policy pursued by the Russian government of taking possession of all important mineral discoveries must tend to check the development of the mineral resources of the country, and lead to the concealment of valuable discoveries. Not only has this system operated thus injuriously, but the mines, rich as they are, have proved of little value to the state in consequence of the irregular practices and abuses attendant upon their exploration by government agents. The emperor therefore is about to abandon the system, and transfer the mines to companies, together with special facilities to aid in their continued development. The old Spanish mining laws, which were established in all the Spanish American possessions, encouraged discovery and the steady working of mines by

allowing any individual, Spaniard or foreigner, to take up a tract of sufficient extent for a mine, and to hold the same so long as he continued to work it, and pay the moderate government dues. The owner of the soil was entitled to damages assessed by disinterested parties for the use of the surface required for mining purposes. These are the existing laws in Ouba, and with some modifications in Mexico and the mining countries of South America which formerly belonged to Spain. They apply to all discoveries of precious stones, and metallic, combustible, and saline substances, whether found upon or below the surface. Mines of mercury are excepted, these being especially reserved to the crown. By notifying the proper officer of the district, the applicant obtains possession of a rectangular plot or *pertenencia*, measuring 200 *varas* (182.6 English yards) in length on the vein by 100 *varas* in width, which, in case of the discovery being new, or in case of reopening abandoned mines, may be extended to 600 *varas* on the vein by the original width. Companies under some circumstances may secure 4 *pertenencias*. For each one an annual tax was laid of 1,000 *reales de vellon* and 5 per cent. of the mineral product. Proprietors can dispose of their interest as of any other property, but their rights are lost, and the mines become subject to denouncement again by other parties, in case of non-fulfilment of the requirements of the law, such as sinking a shaft within 90 days, working the mine with at least 4 men to each *pertenencia*, not abandoning it for 4 months at a time, and not allowing the buildings to go to ruin.—Though mining is a special department of the Spanish government, little publicity is given to the statistics of the mineral productions. But in most of the other countries of Europe, as England, France, Sweden, Norway, Prussia, Austria, and Saxony, full records are kept and published, which present a fair approximation to the real production of these countries.—In France the *département des mines* is an important branch of the government, including matters relating not only to mines themselves, but also to turf and peat, metallurgical works, dangerous and unwholesome establishments, steam engines, mineral springs, geology, agriculture, workmen, mining schools, &c. The corps of *ingénieurs des mines* has included more distinguished scientific men than any other learned body in the world. From a very early period great attention has been given in that country to mining legislation; and within a few years one of the *ingénieurs des mines*, M. Lamé Fleury, has been commissioned to collect together all the various laws, decrees, and public acts of the government in this department. This he has done, commencing with the time of Charles VI. The king appears to have had the sole disposition of mining property, granting concessions to whomsoever he pleased, though there have also been grand masters, the last of whom was the duke de Bourbon, who performed the same office. Coal mines were free from this control

until the abuses and accidents incident to working them rendered royal interference necessary. The last recorded concession was of tin, lead, and coal mines at Otentin in 1791. In that year it was proposed to give up the control of mining property to the proprietor of the soil, against which Mirabeau pleaded strongly; and a law was passed compromising the matter, the proprietor of the soil retaining all to the depth of 100 feet, below which the government took possession. This proved unsatisfactory, and the law was modified in 1810, an improved code being soon after established, by which the government reserved the right of granting concessions, and compensation was provided to the land owner for damages to which he might be subjected. It is believed that the intention was that this law should lead to the land owner acquiring full possession on his giving satisfactory security for his ability to develop the mineral treasures of his lands; but subsequent legislation has confirmed the government in their control. The law of 1888 gave to the state the right of withdrawing a concession under certain circumstances, and that of 1882 rendered necessary the assent of the state for the union of different concessions. A principal cause of the interference of the governments in mining matters has been the terrible explosions in collieries involving the loss of many lives. In England it is only in reference to this object that the government exercises any special jurisdiction over mines. Collieries are there subject to the inspection of engineers appointed for the purpose of insuring, by ventilation and a proper system of operations, protection against accidents. Under the laws of Great Britain mines have generally been the property of the lords of the soil, those containing gold and silver excepted, which up to the reign of William and Mary were termed royal mines, and paid dues to the crown. The government also held mining properties in the forest of Dean, which were leased somewhat on the plan of the concessions of other countries. In Scotland, previous to 1775, persons employed about the coal mines were held as property, and were transferable with the estate. They were emancipated by the act 15 George III., c. 28. Companies engaging in mining enterprises at present in Great Britain obtain from the lord of the land a lease called a "set," and he is usually paid by a royalty or rent in money or a percentage of the products. The average of the lord's dues is usually about $\frac{1}{3}$ of the gross products. In the United States deeds of real estate convey the entire control of all minerals belonging to the property, unless these are specially reserved. The law recognizes no distinction between mining and other property.—In several of the mining districts and capitals of Europe, schools are established particularly for instruction in those branches connected with mining; and some of these enjoy a high reputation, as that of Freiberg in Saxony, that of Clausthal in the Hartz, and the *écoles des mines* of Paris. The school at Schemnitz in

Hungary has been founded since 1760. In England a government school of mines was opened in London in Nov. 1851, in connection with the "museum of practical geology;" in Truro, Cornwall, and in Bristol, schools of similar character are established. In the United States no institution exists specially devoted to these objects.—The statistics of the metallic produce of the principal mining countries of the world for the year 1854 are presented by Mr. J. D. Whitney in his work entitled "The Metallic Wealth of the United States," and his tables, from which the accompanying table is prepared, offer the nearest approximation for estimating the value of these products, and the relative importance of different countries in this department. In the production of some of the metals, for the United States especially, more facts of recent date may be found by reference to the separate articles in this work. A discrepancy may sometimes be observed in statistics of this character, from want of distinction between the crude products of the mines and the metals into which they are afterward converted; and where gold is the principal mineral product, which is obtained originally in the metallic state, this confusion is perhaps more liable to occur, the other metallic products being estimated in their crude condition of ores. The English government returns, as annually compiled by Mr. Robert Hunt, keeper of mining records, specify in separate tables the amount and value of the crude products and of the metals derived from them. The following later memoranda may be added to the information contained in the above table. The Russian product of gold, silver, platinum, iron, copper, lead, zinc, coal, and salt, is estimated by M. L. de Tegoborski ("Commentaries on the Productive Forces of Russia," London, 1855) to reach the value of £5,460,000, of which more than 55 per cent. is gold alone. Adding to these the value of the granite, ornamental stones, gems, &c., of Siberia, the gross value of the mineral products of the empire is rated at £6,888,888. The metallic products of the Austrian mines in 1851 were reckoned at 26,469,839 florins (\$12,970,221), and the salt product at 53,194,942 florins (\$26,065,521). The mineral product of Prussia is found from year to year to amount in value to about £5,000,000. In 1857 it was made up as follows: coal, £3,522,802; lignite, £398,380; iron ore, £357,605; zinc ore, £457,808; lead ore, £257,662; copper ore, £93,614; other minerals, £27,000; total, £5,111,821. Prussia produces more zinc than all the other countries of the world. In France the annual value of the mineral products is rated by M. Schnitzler at £16,800,000, including the products of the quarries and of the peat bogs to the amount of £1,600,000. His rates of valuation are much higher than those of Te-

| COUNTRY. | GOLD. | SILVER. | MERCURY. | TR. | COPPER. | IRON. | LEAD. | ZINC. | PLAT. | OTHER. |
|------------------------------|---------|---------------|-----------|--------------|---------|-------|--------|-------|--------|--------|
| Lbs. troy. | Value. | Lbs. troy. | Value. | Tons. | Value. | Tons. | Value. | Tons. | Value. | Tons. |
| Russia..... | 60,000 | \$14,880,000 | 55,000 | \$925,000 | ..... | ..... | ..... | ..... | ..... | ..... |
| Sweden..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Norway..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Great Britain..... | 100 | 24,900 | 17,000 | 275,000 | ..... | ..... | ..... | ..... | ..... | ..... |
| Belgium..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Prussia..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Hart..... | 6 | 1,458 | 80,000 | 480,000 | ..... | ..... | ..... | ..... | ..... | ..... |
| Hart..... | ..... | ..... | 80,000 | 480,000 | ..... | ..... | ..... | ..... | ..... | ..... |
| Rest of Germany..... | ..... | ..... | 60,000 | 960,000 | ..... | ..... | ..... | ..... | ..... | ..... |
| Austria..... | 5,700 | 1,418,800 | 90,000 | 1,440,000 | ..... | ..... | ..... | ..... | ..... | ..... |
| Switzerland..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| France..... | 49 | 10,416 | 5,000 | 80,000 | ..... | ..... | ..... | ..... | ..... | ..... |
| Spain..... | ..... | ..... | 125,000 | 2,000,000 | ..... | ..... | ..... | ..... | ..... | ..... |
| Italy..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Africa..... | 4,000 | 992,000 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| E. Asia and East Indies..... | 25,000 | 6,300,000 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Australia and Oceania..... | 150,000 | 87,500,000 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Chile..... | 3,000 | 744,000 | 8,000 | 128,000 | ..... | ..... | ..... | ..... | ..... | ..... |
| Solivia..... | 1,200 | 297,600 | 180,000 | 2,080,000 | ..... | ..... | ..... | ..... | ..... | ..... |
| Peru..... | 1,800 | 471,200 | 300,000 | 4,800,000 | ..... | ..... | ..... | ..... | ..... | ..... |
| Colombia..... | 12,000 | 3,780,000 | 15,000 | 208,000 | ..... | ..... | ..... | ..... | ..... | ..... |
| Porto Rico..... | 10,000 | 2,458,000 | 1,750,000 | 28,000,000 | ..... | ..... | ..... | ..... | ..... | ..... |
| Mexico..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Cuba..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| United States..... | 200,000 | 48,600,000 | 23,000 | 592,000 | ..... | ..... | ..... | ..... | ..... | ..... |
| Total..... | 481,900 | \$119,522,600 | 2,925,300 | \$47,442,300 | ..... | ..... | ..... | ..... | ..... | ..... |

goboraki. The mineral statistics of Great Britain were as follows for the year 1858:

| Minerals | Tons | Value. |
|-----------------|------------|------------|
| Tin..... | 10,818 | \$271,057 |
| Copper..... | 224,959 | 1,884,535 |
| Lead..... | 85,835 | 1,870,728 |
| Zinc..... | 11,536 | 34,199 |
| Pyrites..... | 100,263 | 77,128 |
| Arsenic..... | 565 | 800 |
| Nickel..... | 4 | 188 |
| Uranium..... | ..... | 91 |
| Manganese..... | 1,400 | 2,800 |
| Gossan, &c..... | ..... | 1,221 |
| Iron ore..... | 3,040,859 | 2,570,701 |
| Coal..... | 65,042,849 | 16,302,182 |

Total value of minerals..... \$22,812,500

| Metals | Tons | Value. |
|-------------|-----------|------------|
| Tin..... | 6,930 | 632,430 |
| Copper..... | 14,456 | 1,562,098 |
| Lead..... | 69,308 | 1,439,005 |
| Silver..... | 549,845 | 156,569 |
| Zinc..... | 6,930 | 174,323 |
| Iron..... | 3,456,064 | 10,712,798 |

Total value of metals obtained from British ores \$14,912,770

Estimated market value of other minerals and metals..... 95,000

Coal..... 16,312,169

Total value of metals, metalliferous minerals, and coal produced in 1858..... \$31,324,939

Mr. Whitney, from the footing up of the total values of the metallic productions of each country, has also prepared the following table:

MINER, THOMAS, an American physician, born in Middletown, Conn., Oct. 15, 1777, died in Worcester, Mass., April 23, 1841. He was graduated at Yale college in 1796. The next 6 years were passed in teaching, and in the study of law, which in 1803 he abandoned for medicine, and in 1807 he commenced practice at Middletown. There prevailed about 1809 in the Connecticut valley a malignant epidemic fever, for which Dr. Miner and his friend Dr. William Tully pursued a new mode of treatment, the former making careful notes of his cases, and numerous autopsies of those which proved fatal. In 1819 he was compelled by disease of the heart to withdraw from active life, and confined himself to a consulting practice and writing. In 1823 he published, in connection with Dr. Tully, "Essays on Fevers and other Subjects," and in 1825 a treatise on "Typhus Syncopalis." Both works were severely criticized, but enjoyed a wide circulation, and led to the formation of a school in medicine which still has numerous adherents.

MINERAL POINT, the capital of Iowa co., Wisconsin, on a branch of the Pickatonokee river, 47 m. W. S. W. from Madison; pop. in 1855, 8,462. It is in the midst of a rich mineral district, yielding large quantities of lead and copper. It has an active business, and contained in 1850 a number of stores, a bank, 4 smelting furnaces, and 5 churches. It is connected by a railroad to Warren with the Illinois central and Galena and Chicago union railroads.

MINERAL VEIN, as commonly understood, a collection of mineral matters, which have been slowly brought together and consolidated in elongated cracks or fissures in the rocks. Dikes are collections formed of molten rock, as lava, which has suddenly flowed into fissures and cooled. Among the earthy minerals, which form the gangue or vein stones, are often found metallic ores, and it is from this source that the chief supplies of the useful metals are obtained. Veins worked for these are called by the miners "lodes." A distinction is made by geologists between veins and beds, which in mining is not often recognized. By the latter term are understood bodies of mineral substances, metalliferous or not, which were deposited at the same time with the rocks which include them; and as in the recent progress of theoretical geology some rock formations that were regarded as of intrusive igneous origin are now considered as derived from sedimentary deposition, so it has happened that many repositories of metallic ores heretofore considered veins are now classed as beds. This is especially the case with the collections of magnetic and specular iron ores like those of New York and New Jersey, the origin of which is now regarded by many as synchronous with the rocks which contain them. In cases like this the distinction is rather of theoretical than of practical importance, the bodies of ore having as great permanency for practical purposes as veins. What some writers call "segregated" veins (collections of mineral matters spread in irregular sheets through rocks, and presenting no evidence of being formed in preëxisting fissures) may for the most part be considered as metamorphosed beds.—Veins are met with in almost all rocks, are traced for miles in length, and penetrate the crust of the earth deeper than man has ever been able to follow them. The origin of the fissures is more readily understood than the source of the materials that fill them. The forces which produce cracks in clays by their shrinkage, and in other substances by change of temperature, also operate to rend apart the solid strata, and fissures in these are also produced by earthquakes and volcanic action. Such openings are naturally found very irregular in their dimensions, and, in districts where earthquake movements have been frequent, interrupted in their continuity, crossed by other fissures of later formation, and ramifying into side openings, some of which may prove as extensive as that which appeared to be the main fissure.

Such is the character of mineral veins where they form an important feature of the geological structure of the country. They are met with in rocks of all ages and in various stages of completion. The fissure is sometimes seen still open, containing only loose earth and stones that have fallen in from above, as in that which crosses the Shawangunk mountain in Ulster co., N. Y., referred to in the article *LEAD*; and sometimes it is partially filled with vein stones or ores, open spaces still remaining unfilled, and forming caverns on the line of the vein, instances of which are noticed in the same article. The fissure again may be quite filled with mineral substances, which may be closely attached to the walls, as if all were originally formed at the same time; or, as is more commonly the case, a parting seam may be found on one or both sides, separating the vein stone from the wall rock, and the faces of each are then often seen presenting a smooth surface, as if they had been rubbed together. A thin layer of tough clay, called by the miners "flucan," is commonly interposed in the seam between the vein and its walls. Veins usually occur in groups of several together, lying nearly parallel to each other both in direction and inclination downward; but as they are followed in one or the other direction along the surface or on their slope down, which is called their dip or "underlay," they are often found to run into each other. While their general line is straight, it is more or less waving in places; and their dip is more variable, often becoming steeper at greater depths, and changing to greater or less steepness along their course. The position of veins in regard to the rocks which contain them is sometimes across their strata and sometimes with them; and in the latter case the veins are often found both in dip and direction to pass across one stratum and continue between different layers from those in which they were first seen, thus establishing their character as veins formed in fissures in contradistinction to beds. Veins of this nature are seen in the gold region of the southern states, and generally along the Appalachian belt also in the western portion of the Lake Superior copper region. Veins cutting across the strata are found throughout the Keweenaw Point district of the same region. Along the line of contact of two rocks of different character, as granite, gneiss, or trap with sandstone or limestone, veins frequently occur, and branches lead off into the rock on one side or the other. Many of the copper lodes of Connecticut and New Jersey, and the lead mines of the Schuylkill, are thus found at the contact of the granitic or trappean rocks with the red sandstone. It appears as if fissures may have opened originally in such positions, and also between adjoining strata of the same rock, for the reason that the disrupting force, when not directed at right angles across the strata, found along these lines the least resistance. A vein which cuts through rocks of different kinds changes not merely as regards its contents, but also in respect to its dimensions,

with the rocks which include it; and it is almost universally the case, that a vein which is productive in one rock ceases to be so as it is followed from this into another. In the western lead region fissures producing lead in the limestones are unproductive, if not entirely lost, in the underlying sandstones.—The veins of each mining district exhibit features that distinguish them from those of other districts. In Cornwall they are found of several sets or systems, which are classed according to the periods of their formation, those which are continuous through others being recognized as belonging to a later period than the veins which are cut. The veins of this district thus distinguished have been referred to as many as 8 systems. The most important of these are the E. and W. copper lodes, which cut and displace more or less the older formed veins, in which tin is the predominant ore. Another set of copper lodes lies in a N. E. and S. W. direction; and "cross courses," which are mineral veins containing very little ore (and this in Cornwall only lead), extend in a N. and S. direction. In the Freiberg (Saxony) district the same number of systems were recognized by Werner as are found in Cornwall. The oldest and most important veins, which have produced the chief supplies of lead and silver, run N. and S. They are crossed by others which lie N. E. and S. W., these by other N. and S. veins, and these again by E. and W. cross courses, and so on. In this small district of only 10 or 11 miles in length by 4 or 5 in breadth, more than 900 different veins have been recognized. These by late observers have been classed in 4 sets, which are distinguished by the contents of the veins as well as by their direction. An account of these lodes is given by Weissenbach in a paper published in Cotta's "Contributions to the Knowledge of Mineral Veins;" and the classification of veins propounded by the author is presented by Mr. J. D. Whitney in his work, "The Metallic Wealth of the United States," p. 44. The mineral veins of the United States, though found pursuing different directions in the same district, rarely cross and displace each other as in Europe; and the irregularities arising from heaves and faults, which there occasion so great perplexity and trouble in following the lodes, are here comparatively unknown. The veins or beds of magnetic iron ore of New Jersey and of northern New York are frequently covered over near the surface, and cut off at different depths below, by layers called "caps" of the gneiss rocks in which they are contained. Through the caps no fissure nor even crack is found leading from the body of ore above to its extension below. They are of several feet in thickness, and when penetrated the ore is often recovered on its regular line. A similar feature is met with at the Chafarillo silver mines of Chili, the veins of which are cut off by a stratum of tough and horny limestone called a *mesa* (table). By sinking through this, in one instance 266 feet, the vein was again found beneath the stratum.

As many as 7 such belts have been found intercepting a vein, and in the spaces between them the vein was continuous, and particularly rich nearest the *mesas*.—The width of veins is very variable, as would naturally result from the form of the original fissures; and that of any single vein is subject to great irregularities, especially where its walls have been moved subsequent to their separating, so as no longer to present corresponding depressions and prominences opposite each other. In places the fissures will thus be found nearly closed by the contact of the two walls, and in others opening out into wide spaces by their separation. At the copper mines in E. Tennessee the lodes attain a thickness of more than 50 feet; but a more common width of veins is below 6 feet. In Cornwall the mean width of the lodes at less than 100 fathoms in depth is rated at 3.97 feet, and at greater depths only 3.86 feet. A vein is described in Chili as about 9 feet thick, which has been traced for 90 miles, and is accompanied by branches that extend 80 miles. The *veta madre* of Guanajuato, Mexico, the most extensively worked and probably the richest vein in the world, has been opened in places along the line of the strata for about 12 miles; it sometimes attains a width of nearly 200 feet. The *veta grande* of Zacatecas averages 25 or 30 feet, and its maximum width is about 75 feet. Veins, however, are not rich in proportion to their size; and in Mexico it is found that some of the most profitable to work are small, it may be not exceeding a few inches in width.—The contents of veins are rarely altogether of a metallic character. A variety of minerals, called vein stones or the gangue, make up the chief part of metallic lodes, among which quartz is the most common, and next to this calcareous spar. Sulphate of barytes, fluor spar, and spathic iron ore are also common vein stones. They occur together with other minerals intermingled with the ores, and near the surface especially often constitute the whole body of the lode, the ores being entirely wanting, or seen only in small particles or in scattered bunches. Usually no order is perceived in the arrangement of the gangue and ores, but in some veins there is a marked exception to this, the materials being symmetrically arranged in corresponding layers on each side proceeding from the wall to the centre. The layers of corresponding pairs sometimes agree in thickness as exactly as they could be set off with a pair of dividers. A vein near Freiberg described by Weissenbach has adhering to each wall a thin layer of blende, inside of this quartz, then fluor spar, then another thin layer of blende, then sulphate of barytes, through the middle of which in each layer is traced a thin streak of iron pyrites; another such streak separates the barytes from the fluor spar, which is the next inner layer, and iron pyrites again lies along the inner side of the fluor spar, separating it from the great central body of the vein, which is composed of calcareous spar, down the middle portion of which a

cavity is traced, showing that the operation of filling the vein had not been quite completed. On the N. shore of Lake Superior, opposite Isle Royale, a vein measured by the writer in 1846 presented the following symmetrical layers: on each side, next the walls of trap, calcareous spar, 8 inches thick; then trap, each layer 6 inches thick; then quartz, each layer $\frac{1}{2}$ inch thick; and within these calcareous spar 20 inches thick, forming the central mass of the vein. Quartz in such veins forms crystals, which project toward the centre at right angles with the walls. In the centre the crystals from each side interlock at their points and form what are called combs. Other parallel lines of these are also met with in some veins nearer the sides, and it is supposed that each one of them was once the central line of the fissure, which was further opened after their deposition, thus giving place to a new central line. Beside these deposits which have been regularly laid upon the walls of fissures, it may be by precipitation from saline solutions, or by sublimations, other materials are found in veins which appear to have fallen in either from above or from the walls, such as pebbles, fragments of rock, and clay. The last named is gathered in the cavities, and often forms a lining between the vein and its walls. Masses of the wall rock are sometimes met with so large, that the dividing of the vein around them appears like the leading off of a branch; nor is this found not to be the case, until the divided portions meet again on the other side of the interposed mass. The miners call such a mass a "horse," probably from the vein going down each side of it like a saddle on the back of a horse. The ores occur in bunches, strings, and layers very irregularly distributed, and usually of many varieties associated together. The ores of one metal commonly prevail either throughout the mine or to a certain depth, below which others may be found more productive. They often lie in courses or parallel belts, which slope in one or the other direction on the line of the vein, and between such courses the workings are comparatively unproductive. Their position and slope being once determined, the works for reaching them most economically on their extension may be planned in advance with confidence. Large developments of ores are looked for where branches drop into the main vein. Near the surface veins are not often found so rich as at some depth below, at least beyond the reach of atmospheric influences; but when once in what the miners call "settled ground," no improvement need be expected as the result merely of greater depth. Many rich lodes of the sulphurets of copper show near the surface no appearance of this metal; the ores have been changed into soluble compounds and the sulphur and copper carried off, leaving behind the ferruginous oxides, one of the products of the chemical changes, in the form of ochreous masses, known by the miners as "gossan," or sometimes, as at the great lodes of E. Tennessee, in solid rocks

of hematite. The condition of vein stones and ores is sometimes very favorable for the continual progress of chemical changes. When sufficiently open for the percolation of water among them, this becomes charged with various salts, and in different proportions at different depths. Electrical currents are induced by the reaction of these solutions upon each other and the various substances they come in contact with, and new mineral compounds are generated and deposited. Numerous instances are recorded of changes thus going on in mineral veins, and the formation of fresh deposits of ore. Portions of a vein have been worked a second time, and the fact been unsuspected until the tools of the ancient miners were discovered in the solid vein stone. Breithaupt records an instance of a miner having fallen down a deep part of the mine at Fahlun, Sweden, and his body, not recovered until the lapse of 60 years, being then found converted into iron pyrites, which had slowly replaced the organic materials, retaining their forms. Being taken out and exposed to the atmosphere, the pyrites after a time decomposed and crumbled away. Upon the walls of the McCulloch mine in Guilford co., N. C., the writer has gathered crystals of sulphate of copper, a recent formation from the decomposition of the pyritous copper of the mine. Such facts suggest the most plausible mode by which the materials of many of the mineral veins have been distributed, but they afford no clew to the original source of the ingredients introduced. Water highly heated and under intense pressure, such as that derived from the great depths to which it penetrates, acquires an extraordinary solvent power, as is witnessed in the deposits of thermal springs, and in the marble-like incrustations that gather upon the inner surface of steam boilers. M. de Senarmont, making use of such solutions as are found in thermal springs, as of carbonic and hydrosulphuric gases, the alkaline sulphates and bicarbonates, heated from 100° to 350° C. in glass tubes hermetically sealed, succeeded in obtaining from different compounds others precisely like the natural ores and various minerals found in veins, some of them crystallized, and different from any products ever before obtained by the humid process. He thus imitated the natural product of copper and silver, as these metals are found attached together, but not in combination, at the Lake Superior mines. Red oxide of iron and red oxide of copper, like the native ores, were thus produced; carbonates and sulphurets of various metals, sulphate of barytes, and quartz in crystals of the most common form. Such solutions, coming in contact with different strata, may possibly be so influenced by the electro-chemical action thus generated as to part with portions of their metallic ingredients; or, penetrating these rocks, may gather the metallic particles disseminated through them, and slowly deposit these particles upon the walls of the fissure. It is only by reference to such principles that attempts

are made to account for the changes observed in a vein accompanying the change of rock in which it is found. The incrustation of mineral substances in the fissures and upon the walls of volcanic craters, and of the oxide of zinc upon the inner walls of blast furnaces in forms exactly resembling in their parallel layers natural ores from veins (see CADMIA), suggests this mode of deposition by sublimation as having taken place in some veins. There is no doubt that the great bodies of the ores of mercury found in some countries have been thus collected. By such agencies the walls themselves of the fissures may be penetrated by the metallic vapors, and becoming charged with these give rise on their condensation to the metalliferous strata often found in contact with veins. The sublimation theory was enunciated by the German miner Lehmann in 1758, and is considered as offering a not improbable explanation of the abundant occurrence of sulphurets in veins, as produced by the action of hydrosulphuretted acid vapors upon other metallic compounds. Beside these modes which have probably operated to produce mineral veins, other theories also have been proposed by different chemists and geologists; as that their materials had been introduced from below in a molten condition, and became solidified in cooling like lava in a dike; but many of the features of veins which have been already considered are entirely opposed to this theory. Werner supposed the materials might have been deposited from solutions introduced from above. Ochreous springs, gathering up from the rocks around their ferruginous ingredients, might thus carry oxide of iron into clefts, but the deposit left upon the surface would betray the origin of this. About metallic veins no superficial deposits are found that would support this theory, while the manner in which the mineral substances are distributed in lodes is entirely opposed to it.—Among the important works which treat upon mineral veins may be named the "Report on the Geology of Cornwall, Devon, and West Somerset," by Henry T. De la Beche (London, 1839); *De la richesse minérale*, by A. M. H. de Villefosse (Paris, 1819); *Lehrbuch der chemischen und physikalischen Geologie*, by Gustav Bischof (Bonn, 1854); and various papers in the "Proceedings of the Geological Society of Cornwall," by Messrs. Robert W. Fox, Joseph Carne, John Hawkins, and others.

MINERAL WATERS, those which, either from the matters dissolved in them, or from their temperature, possess medicinal properties. All spring and well waters are impregnated more or less with mineral elements, derived from the soil through which they pass; but only such as may be used for the treatment of disease, or for some special influence on the animal economy, are classed as mineral waters. It is not necessary that the amount of mineral matter in them should be large, for in some of the most highly prized it is very small, and others, by common consent classed as mineral

waters, seem to owe their curative power to increased temperature alone. Mineral waters are commonly first recognized by some peculiarity in taste or smell, or by a higher temperature; but their value has been generally established by the cures they may have effected. As the methods of analytical chemistry have been improved, they have been used to analyze the most celebrated mineral waters. The problem is always a difficult one, and very much yet remains to be done. Of the hundreds of mineral springs in America very few have been thoroughly analyzed. Mineral waters are used both for drinking and for bathing, the chief use of the thermal or warm springs being for the bath. The Greeks and Romans were well acquainted with hot and warm springs; they also used mineral waters for drinking. The luxurious Romans were accustomed to spend their summer months at Baia, where the sulphur waters were used as the sulphur springs of Virginia, Harrowgate in England, and Aix la Chapelle are at this day. The salts most commonly found in mineral waters are the chlorides of sodium, calcium, and magnesium; the sulphates of potash, soda, lime, magnesia, and alumina; the carbonates of potash and soda, and bicarbonates of lime, magnesia, and iron, with several nitrates, silicates, and the sulphides, iodides, and bromides of the alkalis and alkaline earths, many of these compounds being kept in solution by the carbonic acid gas or by sulphuretted hydrogen, with which some of the most noted mineral waters are charged. It is claimed that recent analysis has shown the famous Carlsbad water to contain carbonic acid, the salts of manganese, iron, iodine, bromine, arsenic, copper, lead, tin, antimony, and some others.—Mineral waters are generally divided into 4 classes: acidulous, sulphureous, chalybeate, and saline. Acidulous or carbonated waters are those charged with carbonic acid; to this class belong the Sweet springs of Virginia, and the Seltzer, Spa, and Pyrmont in Europe. Sulphur waters are those impregnated with sulphuretted hydrogen or soluble sulphides, such as the White, Red, and Salt Sulphur of Virginia, Harrowgate in England, and Aix la Chapelle in Rhenish Prussia. Chalybeate or ferruginous waters are those which contain in solution the salts of iron; among this class are the Bedford, Pittsburg, and yellow springs in the United States, Tunbridge and Brighton in England, and Wiesbaden in Germany. The 4th class, saline springs, embraces waters of the greatest diversity, such as the Saratoga in the United States, Cheltenham and Bath in England, and Seidlitz in Bohemia.—The value of mineral waters has been best shown in the treatment of obscure and chronic diseases. In many instances persons have been restored to health, or greatly relieved, by use of mineral waters when all other remedies proved of no avail. This has sometimes happened for the reason that such waters often contain compounds not yet known to chemistry or pharmacy; the salts of iodine and bromine are of recent

discovery in chemistry, but as component parts of certain mineral waters have been successfully used for centuries in the treatment of disease. So there may be other remedies still unrecognized except in the effects produced by particular waters. The best known mineral waters are now prescribed by the faculty in certain diseases with as much confidence as any preparation known to the apothecary. They are often recommended in the treatment of diseases of the skin, liver, spleen, and urinary organs; in dyspepsia, jaundice, gout, and rheumatism. The chalybeate waters are said to strengthen the tone of the stomach and to increase the red particles in the blood, which, according to Liebig, perform an important part in respiration. Experiments have proved that the number of red particles in the blood may be doubled by the use of preparations of iron.—The number of mineral springs in the United States is very great, but many of them are little known beyond their own neighborhoods. Bell, in his work on the "Mineral and Thermal Springs of the United States and Canada," has given a brief description of nearly all of note. Dr. Moorman has recently presented the claims especially of Virginia in "The Virginia Springs and Springs of the South and West." The English mineral springs have been described popularly and scientifically by Dr. A. B. Granville, "Spas of England" (1842). For an account of the springs of Germany, some of which are very justly celebrated, the work of Blum, *Natürliche und künstliche Mineralwasser* (Brunswick, 1853), may be consulted. The mineral springs of France have been carefully studied both by chemists and physicians, and the results given by a number of recent writers, among whom may be mentioned Durand-Fardel, *Traité thérapeutique des eaux minérales de France et de l'étranger, et de leur emploi dans les maladies chroniques* (8vo., Paris, 1857), in which are described and classified nearly 250 springs in France; the same author, assisted by others, *Dictionnaire des eaux minérales et d'hydrologie médicale* (Paris, 1859-'60); Ossian Henry on the analysis of mineral waters (8vo., Paris, 1858); and Lefort's *Traité de chimie hydrologique* (8vo., Paris, 1859).—Many of the most celebrated mineral waters having been analyzed, different chemists, both in the United States and Europe, have attempted to prepare artificial substitutes which shall exactly imitate the natural. Others have endeavored to compound and invent artificial waters which shall possess specific properties and be applicable in particular diseases. A small volume by Dr. H. Hager (in German) on the manufacture of artificial mineral waters describes the apparatus used for the purpose in Germany, where considerable success has been attained.

MINERALOGY, the science which treats of natural inorganic bodies belonging to or found upon the earth, distinguishes the several varieties from each other by their peculiar physical or chemical properties, and groups them into

systems. In its domain are included all natural products which belong neither to animal nor vegetable bodies, but not artificial compounds, such as are in vast numbers produced only by the hands of man. Often, however, it happens that compounds known only as artificial come to be discovered as natural products also, and are thereafter classed as minerals. From the various forms which the same element or compound assumes under different conditions, being sometimes a solid, a fluid, or a gas, it is obvious that no distinction can be made on these grounds among inorganic bodies; and hence water, the air, and other natural gases, are as necessarily included among minerals as the solid bodies of which they may form a part.—As a science mineralogy is of modern date. For the sake of their useful qualities and beautiful appearance stones of various kinds have always been an object of interest to man. But the ancients, knowing nothing of their chemical composition and but little of their properties, were incompetent to establish any science of mineralogy. Their authors frequently alluded to minerals, and sometimes attempted descriptions of them; but these were so vague, that even in the treatise of Theophrastus upon stones, and in those of Pliny in the last 5 books of his great work on natural history, which were specially devoted to this subject, a great number of the minerals named cannot now be identified, and the properties ascribed to many of them are purely imaginary. This is especially the case with those to which medicinal properties were ascribed, as seen in the works of Dioscorides and Galen. Pliny, beside the numerous minerals of which he gives an account, refers to many more as being known; but he makes no attempt to bring them into any systematic arrangement beyond the grouping of metals by themselves, and devoting a chapter to earths, another to stones, and another to gems. The Arabian philosopher Avicenna, in the 11th century, divided minerals into 4 classes, viz., stones, salts, sulphurous or inflammable bodies, and metals. Agricola, in the early part of the 16th century, made a more elaborate division founded on the external characters, and chiefly upon the differences in the texture and tenacity of minerals. During the 17th century little progress was made toward establishing any more exact system. Minerals were now in the hands of the alchemists, and the properties next recognized in them were developed by means of their experiments. Magnus von Bromel, a Swede, and pupil of Boerhaave, introduced in his work, published at Stockholm in 1730, distinctions founded upon the effects of heat in calcining some minerals, and in causing the metals to fuse at different temperatures. Linnæus devoted much attention to the study of minerals. He observed the diversity in their crystalline forms, and in his classification, founded upon chemical and external characters, we meet with many familiar distinctions and names. Among the orders of his class of *petra*, or stones, are the calcareous,

argillaceous, and arenaceous. With the progress of chemistry improvements in the correct grouping of minerals were introduced by Henckel, Pott, and Woltersdorf of Saxony, and more especially by Wallerius, who formed his orders and genera on chemical characters alone, determining the species chiefly by their external characters. Cronstedt of Stockholm was the first to recognize the distinction between rocks and minerals, and to exclude the former from a mineralogical system. His arrangement was based on the chemical properties of minerals, and upon principles still recognized. His treatise, first published at Stockholm in 1758, was soon after translated into many European languages, and was received with great favor. Still from the imperfections of the descriptions it was found difficult to determine the mineral species; and in this respect the work of Abraham Werner on the external characters of minerals, *Von den äussern Kennzeichen der Fossilien*, published at Leipsic in 1774, exhibited a great advance beyond all that had been written before. By his clear perception of the true distinctive external characters of minerals (such only, however, as are perceptible to the eye, the tongue, or the hand), and great facility in describing these, Werner gave a new precision to the system; and at a time when nothing was known of crystallography he recognized the importance of observing the crystalline forms of the minerals, at the same time founding his principal divisions upon their “natural affinity” or chemical composition. Though his only subsequent publication was a translation of Cronstedt’s mineralogy, he presented his own views so fully in the notes, that his system, taken up and expanded by his pupils, became the only one recognized for more than 40 years in all the universities of Germany. According to this, all minerals were included in 4 classes: earths, salts, inflammables, and metals, these being formed on their “fundamental constituent parts.” The first was divided into the orders silicious, argillaceous, calcareous, and talcose. External characters in some instances were admitted to control the place of genera, whatever the chemical composition of the minerals; thus the diamond, sapphire, and others which contained no silex, were ranked among silicious earths. This system was adopted by Kirwan of Dublin, who in 1784 was the first in Great Britain to publish a work on mineralogy; and it was fully expounded by Prof. Jameson of Edinburgh. Mineralogy had now fairly engaged the attention of scientific men, and many were advancing it, each in his special department. Romé de Lisle appears to have been the first to fully appreciate the importance of the crystalline forms of minerals, and this branch he clearly presented in 1788 in the 2d edition of his *Cristallographie, ou description des formes propres à tous les corps du règne minéral* (4 vols. 4to.). But with the chemists the chemical composition of the minerals was esteemed their most important feature, and the crystalline forms they comparatively neglected. Klaproth of

Berlin devised new methods of analysis, and applied them with great ability to the determination of the true composition of many minerals, as also to the detection and elimination of new elements in mineral compounds. The abbé Haüy, on the other hand, devoted himself almost exclusively to the consideration of the crystalline forms. He made these the chief means of determining the mineral species, and showed how the varieties of secondary forms were traceable to an ultimate molecule of invariable shape, peculiar to each species, which being ascertained by mechanical division may serve better than chemical analysis to designate the mineral; for though the composition also may be constant, the mixture of heterogeneous substances often prevents this from being accurately found out. Crystals, which before ranked rather as the flowers of the mineral kingdom, now became its most expressive features; and though the result was the establishment of a new and important department of mineralogy, a large proportion of the mineral species were comparatively disregarded, owing to their amorphous, earthy, or compact structure. The abbé Haüy, however, did not entirely overlook the accessory aids afforded by marked peculiar physical or chemical characters, as may be seen by reference to his work, *Tableau comparatif des résultats de la cristallographie et de l'analyse chimique*, published in Paris in 1809. His arrangement of minerals, founded on their chemical composition, is in 4 classes, viz.: 1, acidiferous substances; 2, earthy substances; 3, combustible non-metallic substances; 4, metallic substances. All crystalline forms were referred to one of 6 types, to which every secondary figure could be traced by mechanical division or mathematical calculation. These types were: 1, the regular octahedron; 2, the rhombohedron; 3, the octahedron with a square base; 4, the octahedron with a rectangular base; 5, the prism with a symmetrical oblique base; 6, the prism with an unsymmetrical oblique base. This system was variously modified by different crystallographers, as Prof. O. S. Weiss of Berlin, Mohs of Vienna, Naumann of Freiberg, and others. In 1822 Haüy published his *Traité de minéralogie*, in which the classes were arranged as follows: class 1, free acids; 2, metallic substances, not having metallic appearance, containing the 8 genera, lime, barytes, strontites, magnesia, alumina, potash, soda, and ammonia, and also the silicates, which, though presented as an appendix to the class, contained more species than all the rest of the class together; 3, true metallic substances, containing 18 genera characterized by the different metals; 4, unmetallic combustible substances.—The next important treatise was the *Grundriss der Mineralogie* of Mohs, published at Dresden in 1822. This work held for a long time the first rank among mineralogical treatises, and even yet is the principal authority in Vienna and other parts of Germany in this science. Minerals were arranged in it in 8 classes. The first comprised 4 orders, viz., gas, water,

acid, and salt, and included in these such bodies as affect the taste, give no bituminous odor, and are of specific gravity below 3.8; the 2d class includes minerals which have no taste and a specific gravity above 1.8; the 3d, all fluid bodies which have a bituminous odor, and all tasteless bodies of specific gravity below 1.8. In the general scheme of the classification a succinct statement is appended to each order, defining the external characters peculiar to the genera and species it includes. Thus by noticing the lustre, specific gravity, color of the streak, hardness, and crystalline structure of any mineral, the order to which it belongs is soon ascertained. By the scale of hardness introduced by Mohs (see *HARDNESS*), great precision and value were given to this character as one of the means of identifying minerals. No test is admitted which can be applied only by changing the natural condition of the mineral, as fusion by the blowpipe, the action of acids, &c. Most of the orders belong to the 2d class, and generally have some comprehensive term to designate them, as spar, gem, pyrites, ore, &c. A single one of these orders often contains minerals differing greatly from each other in their chemical characters and composition. The genera under these have the names of common minerals, as quartz, feldspar, augite, &c., while the species are distinguished by some epithet usually descriptive of their crystalline structure or some other marked peculiarity. The mineralogical treatises of Jameson of Edinburgh, which appeared during the early part of the present century up to the year 1816, closely followed the system and nomenclature of Mohs.—Berzelius, the Swedish chemist, regarded mineralogy more exclusively as a branch of his favorite science, and ascribed the failure to recognize its dependence as a science solely upon a chemical basis to the want of familiarity with chemistry among its votaries. He considered all compound bodies as formed of electro-negative and electro-positive ingredients, the more strongly united as their respective electro-chemical forces are more opposed to each other; and in systematizing these compounds the law of definite proportions may be applied, giving to the arrangement a mathematical exactness like that already attained in chemistry. He established two great groups, the one consisting of metals which occur in a native state, and of binary compounds in which oxygen is not an element; and the 2d consisting of compounds containing oxygen. In this 2d group are numerous subdivisions, formed according to the degree of oxidation. The electro-positive oxides are succeeded by those of electro-negative character, then the hydrates, silicates, those with one, and those with many bases, the silico-aluminates, titanates, tungstates, borates, tantalates, carbonates, &c., each acid or the electro-negative element having its own division. His work was translated into French, under his direction, and published in Paris in 1819, with the title *Nouveau système de minéralogie*.—

Hat'y's system was generally received in France until the appearance of Boudant's *Traité de minéralogie* in 1824. It then gave place to the chemical system of this author, which prevailed for many years afterward. Recognizing the insufficiency of physical characters either for determining species or grouping these into genera, Boudant has selected the electro-negative principle in minerals as the basis for forming his genera, and distributed these into 3 great classes, which also are distinguished wholly by their peculiar chemical properties. The first, called *gasolytes*, contain as an electro-negative element bodies, gaseous, liquid, or solid, susceptible of forming stable gaseous combinations with oxygen, hydrogen, or fluoric acid. Under this are ranged the family of silicious minerals, that of the carbonides, including carbon, the carburets, carbonites, carbonates, and sulpho-carbonates; of the chlorides, consisting of the hydrochlorates, chlorurets, and chloro-silicates; and other families similarly formed. The second class, called *leucolytes*, contains as an electro-negative principle solid bodies which give white solutions with acids, and are not susceptible of forming permanent gases. This includes the families of aluminides, magnesides, antimonides, stannides, hydrygarides, argyrides, and others. The 3d class, called *chroicolytes*, contains as an electro-negative element bodies which give with acids colored solutions, and cannot be resolved into permanent gases. This includes all the metals and oxides not embraced in the 2d class. In this arrangement the claims of mineralogy to a natural method of classification are entirely disregarded; and the metallic compounds especially are separated from each other in a manner which renders their determination difficult without an acquaintance first made with their chemical properties.—The system of Brongniart, which succeeded that of Boudant, also recognizes the chemical composition as the most important basis of classification. As this changes, the physical properties change with it, and these moreover may be seen under various modifications, while the composition remains the same. But instead of grouping the species into genera according to their electro-negative element alone, he adopts a mixed method, applying this principle only to the ancient class of earthy salts and stones, or silicates, and arranging the metallic minerals according to the electro-positive element—according to the metallic base rather than the acid. By this double method, in the one class, he avoids bringing such diverse compounds as alum, sapphire, and feldspar into juxtaposition, merely because their base, alumina, is the same, and in the other all the advantages of a natural classification are secured, and the combinations of each metal forming its ores are conveniently grouped together under one genus, which is the metal itself. The first class of his great division of inorganic bodies (which does not include the mineral coals and other substances derived from organic bodies) is called

gasolytes, and comprises 20 elements, one or other of which is found in every mineral compound, and which may be termed mineralizers. Arranged according to their electro-negative order, they are as follows: oxygen, hydrogen, sulphur, selenium, chlorine, iodine, bromine, fluorine, carbon, boron, silicon, titanium, tantalum, tellurium, arsenic, phosphorus, antimony, tungsten, osmium, mercury. The second class, *métales autopsides*, is made up of the true metals and their compounds only. The third class, called *métales hétéropsides* (earthy and alkaline bases), comprises two orders. In the first are found the hydrates, oxides, quartz, corundum, and other minerals not containing an acid; the 2d order is made up of salts arranged according to their electro-negative rank, as chlorides, fluorides, phosphates, arseniates, nitrates, sulphates, carbonates, borates, boro-silicates, fluo-silicates, silicates, aluminates.—In 1840 a work on crystallography was published by M. Gustav Rose, in which minerals were arranged in 6 systems according to their crystalline forms, and in each of these their distribution into genera and species was according to the chemical system of Berzelius as proposed in the 2d edition of his treatise on the blowpipe. A similar mixed method characterizes the *Krystallo-chemisches Mineral-System* of Gustav Rose, published in 1858; but the crystallographic feature is made much less prominent. In it minerals are divided into the following 4 classes: 1, simple bodies; 2, compounds of sulphur, selenium, tellurium, arsenic, and antimony; 3, compounds of chlorine, fluorine, iodine, and bromine; 4, oxygen compounds. The species, determined by their chemical composition, are grouped into genera according to their crystalline forms. The 4th class, from the great number of its members, is necessarily subdivided. The two principal divisions are: 1, of binary compounds; and 2, of double or many times binary compounds; and in each of these are formed groups based on the relative proportion between the atoms of oxygen of the base and of those in the acid, as expressed by the formulas respectively, R^2O , Ro , R^2O^2 , Ro^2 , Ro^3 , for the first division; and in the 2d by the formulas resulting from the combinations of these, as R^2O^2 , R^2O^3 , Ro^3 , R^2O^4 , Ro^4 . Each of these subdivisions is again divided into groups distinguished by their crystalline forms, and the system of subdivision is continued on chemical principles until the species is at last left by itself.—The most complete descriptive mineralogy of the present day is the *Traité de minéralogie* of A. Dufrenoy, the 3d edition of which was published in Paris in 1856 (5 vols. 8vo.). The author recognizes natural groups in the mineral kingdom, in some of which, as the metals, the peculiar characters are derived from the bases, and in others, as the silicates, from the acids; and he therefore adopts the mixed system of Brongniart as more in harmony with the natural properties of minerals, and also more convenient for study. Even when considered in relation to their crystalline forms, he regards it quite as philosophical

to classify minerals according to their bases as according to their acids; for though forms belonging to the same crystallographic system often accompany the same acid in many of its combinations, there are so many exceptions to this that it cannot be regarded as a law; and on the other hand there are many instances of isomorphous acids, which replace each other in all proportions. Moreover, if all crystals, artificial as well as natural, be considered, there will be found quite as much reason from the great number of these instances for grouping them with relation to the bases as the acids. The metals and the silicates thus form two distinct classes, and a third presents itself of the acidiferous substances; but these may conveniently be divided into two, the one containing alkaline bases and soluble in water, and the other the earths and the alkaline earths. Two more classes complete these divisions, making 6 in all; and the whole are thus arranged: I. Simple bodies, 25 in number, electro-negative, never acting as bases with substances of the other classes, and one or other of them present in every binary compound; forming permanent gases, either singly or in combination with other bodies of the same class. Each constitutes a genus. They are as follows: 1, oxygen; 2, hydrogen; 3, nitrogen; 4, chlorine; 5, bromine; 6, iodine; 7, fluorine; 8, carbon; 9, boron; 10, silicon; 11, titanium; 12, tantalum; 13, sulphur; 14, selenium; 15, arsenic; 16, phosphorus; 17, vanadium; 18, antimony; 19, tellurium; 20, mercury; 21, molybdenum; 22, tungsten; 23, chrome; 24, osmium; 25, rhodium. Although thus classified, the description of the genera titanium, antimony, tellurium, mercury, molybdenum, osmium, and rhodium is to be found in the work itself among the metals, with which the various species derived from these substances have the greatest analogy in their external characters. II. Alkaline salts, soluble in water, and having a decided taste, which is usually characteristic. The class contains the 8 genera: 26, ammonia; 27, potash; 28, soda. III. Earths and alkaline earths, substances of stony appearance, colorless or milk white, none hard enough to scratch glass except corundum; specific gravity of all between 2.7 and 4.6, except tungstate of lime, which is 6; nearly all are infusible before the blowpipe, and all fail to be reduced by its action. There are 6 genera: 29, barytes; 30, strontia; 31, lime; 32, magnesia; 33, yttria; 34, alumina. IV. Metals, comprised in two divisions, the 1st containing the native metals and natural alloys, and the 2d combinations of the metals with oxygen or acids. The genera are as follows: 35, cerium; 36, manganese; 37, iron; 38, cobalt; 39, nickel; 40, zinc; 41, cadmium; * 42, lead; 43, tin; 44, bismuth; 45, uranium; 46, copper; 47, silver; 48, gold; 49, platinum; 50, iridium; 51, palladium. V. Silicates, minerals commonly known by the an-

cients as stones, on account of their stony appearance. They are arranged in two groups, the anhydrous and hydrated silicates. The species belonging to the former are hard, insoluble, and attacked with difficulty by the acids. Those of the latter are tender and dissolve readily in acids. The specific gravity of the class is between 2.3 and 3.6; and few reach this extreme. The genera are as follows: 52, aluminous silicates, Al Si ; 53, hydrated aluminous silicates, $\text{Al Si} + \text{Aq}$; 54, silicates of alumina, and lime or its isomorphs, $\text{Al Si} + (\text{Ca, Mg, Fe, Mn}) \text{Si}$; 55, silicates of alumina and alkalies and their isomorphs, $\text{Al Si} + (\text{K, Na, Ca}) \text{Si}$; 56, hydrated silicates of alumina with alkalies, lime, and isomorphs, same formula + Aq ; 57, silicates not aluminous, R Si ; 58, silico-aluminates, * $\text{Al Si} + \text{R Al}$; 59, silico-fluates, $\text{Al Si} + \text{Al Fl}$; 60, silico-borates, $\text{Ri Si} + \text{R Bo}$; 61, silico-titanates, $\text{R Si} + \text{Ti Si}$; 62, sulpho-silicates, R Al, Si, Su ; 63, aluminates, R Al . VI. Combustibles. Genera: 64, resins; 65, *suijs de montagne*, "mountain tallow," a variety of combustible wax-like substances found with lignite; 66, bitumens; 67, coals and peat.—All these systems of classification, except that of Mohs, while they afford to mineralogists a convenient method of arranging their collections, and are instructive by suggesting the relations existing between those of the same groups, are deficient in one important object, which is the presenting to pupils the means of identifying species with which they are not familiar. They even presuppose an acquaintance with the chemical composition of the mineral before it can be referred to its proper place. To meet this objection Dufrenoy arranged several sets of tables. One contains the various crystallized minerals grouped according to their crystalline forms, by which, when that of an unknown mineral is observed, further search for its name is limited among the few others that possess the same form. Another set of tables presents the minerals arranged according to their mode of texture, each group being distinguished by certain peculiarities of fracture or structure, with subdivisions depending on the kind of lustre. Another useful aid for attaining the same object is the application to mineralogy of the method introduced by De Lamarck for determining botanical species, and named by him *dichotomique*, which consists in presenting, in the table prepared for the purpose, two opposite qualities, one of which being selected as belonging to the species, the number of another pair is indicated, to which the mineral is next referred, and so on, until at last the investigation is terminated by reaching the name of the species. This method is based as much as possible on external characters, the chemical properties being brought in when the former are inadequate for the determination.—Numerous other treatises of importance have been published in Europe upon this science within a few years past; and among these none is more

* In a table of the classification at the end of vol. IV., cadmium appears in the first class, thus arranged: 18, tellurium; 19, cadmium; 20, antimony.

* Genus omitted in the final table.

worthy of mention than the *Lehrbuch der chemischen und physikalischen Geologie* of Gustav Bischof, which has already been referred to in the article *Geology*. It is not a descriptive work on minerals, but a profound treatise upon their properties and chemical characters, and stands in the same relation to mineralogy as a work on vegetable physiology does to botany. The treatise by H. J. Brooke and W. H. Miller, published in 1852 under the title of "Elementary Introduction to Mineralogy," and based upon the excellent "Elementary Treatise on Mineralogy" of William Phillips of 1816, 1828, and 1837, is also a work of great importance.—In the United States mineralogy had been but little cultivated before the beginning of the present century. A few collections of minerals had been brought from Europe, but the treatises of Kirwan and Jameson were almost the only works that could be consulted with reference to them, and very few persons were acquainted with these. In 1816 Prof. Parker Cleaveland, of Bowdoin college, published "An Elementary Treatise on Mineralogy and Geology," which was well received both in America and in Europe as a work of scientific importance, and particularly useful for the information it afforded respecting American minerals. The author, following the general plan of Brongniart at that time, sought to unite with the precise descriptive language of the system of Werner the chemical classification of the French mineralogists. Notwithstanding the very faulty arrangement of Haüy which he adopted, his work continued to be for many years highly popular, and indeed almost the only one in use by American mineralogists. A second edition of it appeared in 1822. Ten years afterward Prof. Charles U. Shepard of New Haven published the first part of his "Treatise on Mineralogy," and in 1835 the second part. He adopted the arrangement of Mohs with little variation, making the natural history or external characters as far as possible the means of determining the species. He however appended a table in which the minerals were also arranged according to their chemical affinities. Francis Alder of Boston republished the then recent "Treatise on Mineralogy" prepared by Robert Allan from Phillips's "Mineralogy," enlarging it by numerous notices of American minerals and of recent discoveries. Like the last named work, it was particularly interesting for presenting many new facts in the development of the mineralogy of the United States.—Prof. James D. Dana of New Haven commenced in 1837 the publication of his treatises upon mineralogy by the issue of the first edition of "A System of Mineralogy, including an extended Treatise upon Crystallography." In the works of this author the department just named is most fully treated, and some of his views are presented in the article *CRYSTALLOGRAPHY* in this cyclopædia. Prof. Dana adopted the classes and in general the orders of Mohs as the basis of his classification in this work. He introduced two very useful tabular classifications for aiding

the learner in determining the names of minerals. One includes crystallized minerals, in which the classes, arranged according to the systems of classification adopted, are divided into two sections distinguished by their unmetallic or metallic lustre; and in these the species are distributed in the order of their hardness, under the heads of hardness, gravity, cleavage, lustre, color, diaphaneity, &c. The second arrangement is independent of crystallization; and the species—presented in the three great classes of *epigæa*, which include the gases, unmetallic liquids, and soluble minerals; *ento-gæa*, the insoluble minerals of the rocky strata; and *hypogæa*, or species of vegetable or animal origin—are subdivided into sections and sub-sections depending on their metallic or unmetallic lustre, and the color or want of color of their streak. This work has passed through several editions, each of which has been modified as the science has been more and more developed. The system of classification adopted in the 4th edition (1854) seeks to combine with the chemical system of Berzelius the arrangement according to crystalline forms. The progress of the science, the author remarks, has afforded the means of giving greater precision and simplicity to this arrangement, until now it seems entitled to become the authorized method. The following are the leading divisions: I. Native elements, including three groups, viz.: 1, hydrogen group, or those elements whose oxides are represented by the formulas RO , R_2O_3 , or RO_2 ; 2, arsenic group, oxides represented by RO_3 or R_2O_5 ; and 3, carbon group, including diamond, coals, and graphite. II. Combinations with elements of the sulphur and arsenic sections which compose the arsenic group; these are arranged under the heads of binary and double binary compounds. III. Fluorides, chlorides, bromides, iodides; this also is subdivided like the preceding class. IV. Oxygen compounds, with the same subdivisions, and including the silicates, titanates, columbates, tungstates, sulphates, phosphates, carbonates, and other related groups of salts. V. Organic compounds, as resins, &c. In this work the subject of isomorphism or homeomorphism, the principle according to which analogous elements, bases, or acids replace one another in compounds without an essential change in the crystalline form, is treated with particular care and fulness. The "Manual of Mineralogy" of the same author was first published in 1843, and a 6th edition in 1854. It contains useful tables for the determination of minerals; and the arrangement of the species is based on the following classes: I., gases, containing hydrogen or nitrogen; II., water; III., carbon and compounds of carbon; IV., sulphur; V., haloid minerals, compounds of the alkalis and earths with the soluble acids or water, or of their metals with chlorine or fluorine; VI., earthy minerals, silica and silicious or aluminous compounds of the alkalis and earths; VII., metals and metallic ores, exclusive of the metals of the alkalis and earths.

MINERSVILLE, a village of Schuylkill co., Penn., on the W. branch of the Schuylkill river and on the Mine Hill and Schuylkill Haven railroad, 4 m. W. from Pottsville, and 66 m. N. E. from Harrisburg; pop. in 1850, 2,951. It is surrounded by hills containing rich mines of anthracite. There were in 1850 a flour mill, saw mill, iron foundry, car factory, and 4 churches (Baptist, Episcopal, Methodist, and Roman Catholic).

MINERVA. See **ATHENA**.

MINGRELIA, a province of Asiatic Russia, in the lieutenantancy of the Caucasus, bounded N. by the Circassian districts, E. by Imeritia, S. by Gooriel, S. W. by the Black sea, and N. W. by Great Abkasia; area about 2,365 sq. m.; pop. 70,000. The surface is generally mountainous, but slopes gradually to the S., particularly toward the Rion, its principal river. The climate is warm and damp, and fevers are prevalent. The soil is exceedingly fertile, and vegetation rapid. The mountains are covered with magnificent forests, and much good land lies waste. Tobacco, rice, and millet are raised, and a good deal of silk, honey, and wine produced. The province is without any internal improvement, and has a savage and deserted appearance. The inhabitants are generally inferior in appearance to the mountaineers of the Caucasus. The dominant religion is that of the Greek church, and the province is divided into 3 dioceses. Mingrelia nearly corresponds with the ancient Colchis; it became subject to Russia in 1803, but is governed by its own prince, who is called Dadian. On the W. coast of the province the Russians have the forts of Redout-Kaleh and Anaklia.

MINHO (Sp. *Minho*; anc. *Minus*), a river of Spain and Portugal, which rises in the Sierra de Mondonedo, in the province of Lugo, Galicia, 9 m. S. of Mondonedo, flows first S. and then S. W., crosses the province of Orense, forms the boundary between the Spanish province of Pontevedra and the Portuguese province of Minho, and falls into the Atlantic at La Guardia, near Caminha, and about 40 m. S. of Vigo. It is about 180 m. long, and is navigable for only a short distance from its mouth, being obstructed by sand banks. Its principal tributaries are the Sil, which joins it on the left about 70 m. from its mouth, and the Tea and Avia on the right. The largest towns on its banks are Lugo and Orense in Spain.

MINHO, or **ESTRE DOURO E MINHO**, the northernmost province of Portugal, bounded N. by the Spanish province of Pontevedra, from which it is separated by the Minho, N. E. by that of Orense, E. by Tras os Montes, S. by Beira and Douro, and W. by the Atlantic; area, about 1,700 sq. m.; pop. in 1857, 483,837. It is a high table-land intersected by several mountain ridges, running in a N. E. and S. W. direction, one of which rises to the height of nearly 8,000 feet. The principal rivers are the Lima and Cavado, both of which flow into the sea, and the Tamega, an affluent of the Douro; there

are also numerous smaller rivers and streams, and the valleys are exceedingly fertile and well cultivated. The principal productions are wine, oil, flax, oranges, lemons, maize, wheat, barley, and oats. The well known wine, called port from Oporto, whence it is shipped, is almost wholly made in this province. The sea and rivers abound with fish, the capture of which affords employment to many of the inhabitants. Good macadamized roads are in progress in Minho. Capital, Braga. This province was the theatre of the principal struggles in the war of independence in the 17th century. Its population is the most intelligent and prosperous portion of the Portuguese people.

MINIATURE PAINTING, a species of painting on a small scale, executed with water colors on vellum, prepared paper, or ivory, or in enamel. The word derives its origin from the ancient practice of writing the initial letters of manuscripts in *minium* or red lead, for the purpose of distinguishing the commencement of chapters or paragraphs. These rubrics, as they were called, gradually received many fanciful adornments at the hands of the illustrators, who added rich arabesque borders, and finally delicately executed little pictures illustrating the text, to which the general name of miniature was applied. The taste for this species of ornamentation existed at a period considerably anterior to the Christian era. The ancient Egyptians illuminated their papyri with colored hieroglyphics; and from passages in Pliny, Seneca, and other classical authors, the art seems to have been familiar to the Greeks and Romans. The middle ages, however, and especially the period extending from the 8th to the 14th century inclusive, witnessed its most perfect development; and the mediæval monks in the solitude of their convents found at once an amusement and a pious occupation in embellishing their missals, breviaries, and other sacred volumes. The illumination of missals was consequently for many ages the chief form in which miniature painting was practised, although, as in the case of fresco and oil painting, subjects other than scriptural or sacred were from the outset occasionally selected. The art seems from an early period to have been divided into two branches, the professors of the first being called *miniatori* or miniature painters, or illuminators of books; and those of the second *miniatori calligraphi*, or calligraphers. "To the first class," says Mrs. Merrifield, "belonged the task of painting Scripture stories, the borders, and the arabesques, and of laying on the gold and ornaments of the MSS. The second wrote the whole of the work, and those initial letters, generally drawn with blue or red, full of flourishes and fanciful ornaments, in which the patience of the writer is frequently more to be admired than his genius." (Mrs. Merrifield's "Ancient Practice," &c., p. xxix.) Sometimes, however, the two branches were practised by the same person, and about the middle of the 14th century the exe-

cution of large illuminated initials adorned with various fanciful objects and figures such as men, animals, birds, flowers, &c., became a distinct occupation, the ornamentation usually extending in scrolls along the upper and lower margins of the page. The pigments employed were of the purest quality, and were applied with an admixture of white in the shape of body colors, the vehicle being some glutinous substance sufficiently diluted in water to leave the surface of the vellum dull and lustreless. The Vatican collection of MSS. contains the most ancient specimen of classical calligraphy extant, a Virgil of the 4th or 5th century with 50 miniatures, beside many others of a somewhat later date; and fragments of an illuminated Homer, which may also be ascribed to the 4th or 5th century, are preserved in the Ambrosian library at Milan. The Byzantine artists particularly excelled as illuminators, and their MSS. exhibit intricate arabesques of mixed foliage and animals, and the richest architectural fancies in the margins, although many of these are said to be repetitions of Romano-Christian works of the 5th and 6th centuries. The most elaborate exemplar of the school is the Menologium, or calendar executed A.D. about 1000 for the emperor Basil II., and which, notwithstanding one half of it is wanting, contains 480 miniatures on a gold ground, illustrating scenes from the lives of Christ and the saints, the history of the church, &c. The period extending from the middle of the 11th to the commencement of the 18th century was the richest in the history of the Byzantine school. Afterward the art rapidly deteriorated among them. Under the early Carlovingian kings, the transcription and embellishment of manuscripts were greatly encouraged; and the Bibles of Charles the Bald, preserved in the imperial library at Paris, and in the Benedictine monastery of St. Calixtus in Rome, are admirably illustrated. The English MSS. are not inferior to the continental, and the Benedictinal of St. Ethelwolf, executed in 968-7 by Godeman, a monk of Hyde abbey, is considered one of the purest specimens of early English art. The celebrated Bedford missal, executed in France for John, duke of Bedford, regent of France under Henry VI., and now in the British museum, is one of the latest and richest specimens of the art of MS. illumination. Among the most celebrated of the *miniatori*, who were also equally if not more celebrated in other branches of art, may be mentioned Simone Memmi, Giotto, Fra Angelico da Fiesole, Jan van Eyck, Squarcione, Girolamo dal Libri, Hans Hemling or Memling, and Giulio Clovio. Hemling was perhaps the best of all the illuminators; and of the industry of Giulio Clovio a memorable example is extant in his "Office of the Virgin," now in the royal library of Naples, the 28 miniatures of which are said to have occupied him 9 years. With the invention of printing the occupation of the illuminator and calligrapher departed, although of late years the practice of embel-

lishing books with illuminated borders and fanciful initials has again come into vogue. But modern invention has substituted for the toilsome efforts of the *miniatori* of the middle ages, various rapid processes for printing designs in colors, of which Owen Jones's publications afford some happy illustrations.—The term miniature painting is now applied almost exclusively to small portraits executed on thin sheets of ivory, which, on account of the semi-transparency of its texture, is preferred to any other material. This property of the ivory renders it necessary for the back to be protected by something perfectly white, as the effect of the painting might otherwise be injured by any dark substance behind showing through. Miniatures on ivory seldom exceed a few square inches in size. When larger sheets are required, the elephant's tusk is sawn round its circumference, and the ivory is steamed and flattened by hydraulic pressure, and finally mounted for use with India rubber on a panel of mahogany or other hard wood. From the tender and romantic associations frequently connected with miniatures, as well as their historical interest, they have commanded the highest talent in the best ages of art. In England the art has been cultivated by an eminent line of artists from Holbein downward, embracing such names as Nicholas Hilliard, Isaac and Peter Oliver, Samuel Cooper, Hoskins, Flatman, Gibson, Cosway, Ross, Newton, Thorburn, &c., whose works are invaluable for the likenesses they afford of distinguished public characters. According to Dr. Waagen, "in no department have the English artists attained so high a state of perfection as in this." Under the first empire the French had many excellent miniaturists, including Isabey, who not only painted on ivory portrait pieces containing many figures, but attempted with success historical subjects; Augustin, Guérin, Saint, Mme. de Mirbel, &c. The most eminent American miniature painter was Malbone, whose works are executed with great delicacy, and after the lapse of many years retain much of their original freshness. Among others who have succeeded in this department of the art are Charles Fraser of South Carolina, Henry Inman, and Staigg, the last of whom is among the most eminent of living artists in this department. Of late years the introduction of colored or retouched photographic likenesses has somewhat interfered with the profession of the miniature painter, although portraits painted wholly by hand, and which catch their expression from the genius of the artist, can never be superseded by a mere photograph. Photography, kept distinct, and regarded only as an auxiliary to the miniature painter, rather aids the latter by the data it affords for greater accuracy of drawing and proportions. (See ENAMEL.)

MINIÉ, CLAUDE ÉTIENNE, a French officer, inventor of the rifle bullet which bears his name, born in Paris about 1810. At an early age he entered the army as a private soldier,

and, after serving several campaigns in Algeria, reached the rank of captain of foot chasseurs. His inventive faculty now began to be exercised with improvements in the construction of firearms and projectiles; and so completely was he occupied with the subject, that, on the supposition that he was losing his efficiency as a military officer, his dismissal was determined upon. Through the influence of the duke de Montpensier he was retained in the service, and encouraged to continue his mechanical labors; and gradually several of his improvements in rifle balls, cartridges, and gun barrels were adopted by the artillery board. In 1849 he was decorated with the cross of the legion of honor; in 1852 he was promoted to the rank of major on the retired list, and soon after was appointed *chef du tir*, or instructor in the use of firearms at Vincennes, where he now resides. The rifle bullet invented by him consists of an elongated cylinder, conical in front and hollow behind, and fitted with a cap of thin iron, which, by filling the grooves of the barrel as the ball is forced through, gives to the latter a precision and range of flight hitherto unknown to the science of gunnery. This was the first effectual introduction of the principle of expansion into the manufacture of firearms. Minié has never taken out a patent for his invention, and has refused very advantageous overtures from the Russian government to establish himself at St. Petersburg in its service. Napoleon III. has presented him with 20,000 francs. Nearly the whole French army and many other bodies of European troops are provided with Minié rifles and bullets.

MINISTER, a high officer of state intrusted with the administration of national affairs. Collectively, the persons who constitute the administration are called in Europe the ministry, and also the cabinet. In Great Britain, of late years, the ministry has been formed by some eminent party leader who has the confidence of the house of commons, and is authorized by the sovereign to organize a cabinet. The person thus charged with the task selects from his party or from those favorable to his policy the members of the ministry, taking himself generally the post of premier or prime minister, and commonly the office of first lord of the treasury. The other principal ministers are the lord chancellor, the three secretaries of state for home, colonial, and foreign affairs, the secretary at war, and the chancellor of the exchequer. Beside these officials, the British cabinet in 1860 comprised the lord privy seal, the chief secretary for Ireland, the postmaster-general, the president of the board of trade, the president of the council, the chancellor of the duchy of Lancaster, the first lord of the admiralty, the president of the poor law board, and the Indian secretary. The composition of the cabinet varies in different administrations, and some cabinets comprise officers who are not in others. Thus, in addition to those already mentioned, the paymaster-general, the

master of the mint, and the commander-in-chief of the army have at one time or another been members of the cabinet since 1830. The cabinet is not a body recognized by English law, and orders and proclamations are therefore issued, not in its name, but in that of the privy council, a much larger body which was formerly the adviser of the crown in all affairs of state. It was in the reign of William III. that the distinction of the cabinet from the privy council, and the practical exclusion of the latter from all business of state, became fully established. The ministry should contain members of both houses of parliament. "The ministry is, in fact," says Macaulay, "a committee of the leading members of the two houses. It is nominated by the crown; but it consists exclusively of statesmen whose opinions on the pressing questions of the time agree in the main with the opinions of the majority of the house of commons." When the house of commons by a decisive vote on a test question shows that it no longer approves the policy of the cabinet, the ministers are expected to resign and make way for a new cabinet.—The executive government of France is divided into 10 departments or "ministries," viz., of state, justice, foreign affairs, interior, finances, war, marine, public instruction and worship, agriculture, commerce, and public works, and Algeria and the colonies. The heads of these departments are members of the cabinet. The cabinet of the president of the United States consists of the secretaries of state, treasury, war, navy, the interior, and of the attorney-general and postmaster-general. These hold office at the pleasure of the president, by whom they are appointed subject to the consent of the senate. While in office they cannot hold seats in congress. The term minister is seldom applied in the United States to members of the cabinet, but is used, as in Europe, to designate diplomatic officers, for which see **DIPLOMACY**, and **LAW OF NATIONS**.

MINIUM. See **LEAD**, vol x. p. 889.

MINK, a small, fur-bearing, carnivorous mammal, found in the northern parts of America, Europe, and Asia, belonging to the genus *putorius* (Ouv.), in which are included the ermine and common weasels, and to the sub-genus *Iutreola* (Wagner). The minks have one molar less on each side above and below, than the martens (*mustela*), and are therefore more carnivorous; the size is smaller, and the form more slender; the color is nearly uniform; the feet much webbed, and their pads large and naked, with the intervals not occupied by hairs. The common American mink (*P. vison*, Rich.) varies in length (from nose to base of tail) from 18 to 18 inches, the tail being 8 to 10 inches additional; the general color is dark brownish, the tail nearly black, the chin white, but not the edge of the upper jaw; some specimens are lighter, even to yellowish brown; the head is broad and depressed, with truncated snout, short round ears, small eyes and far forward, long and rigid whiskers in 4 horizontal series; body long and

vermiform, with long neck; short and stout limbs, with 5-toed feet, armed with sharp claws; tail long and cylindrical, having on each side of the under surface a glandular cavity secreting a strong musky fluid, whence the generic name; mammae 6, ventral. The under fur is soft and downy, with larger and coarser hairs intermingled; the more southern the locality, the coarser and stiffer is the fur. The mink is an active, destructive depredator in the farm yard, sometimes killing several chickens in a single night, though less sanguinary than the weasels; it now and then catches a fish on its own account, and frequently steals those left inadvertently by the angler; it feeds also on small rodents, marsh birds, frogs, and crawfish. It takes up its residence on the borders of ponds and small streams, especially near rapids and waterfalls; it is an excellent swimmer and diver, and a good runner; it rarely climbs trees like the martens, unless when hotly pursued; when killed in the water, it almost always sinks. It is readily caught in box or steel traps, or in dead-falls, baited with the head of a bird; it is very tenacious of life, and most active at night. In northern New York, the breeding season begins toward the 1st of March, while the snow is on the ground; the young, 5 or 6 in number, are born about the end of April; when taken young, it is easily domesticated. The fur of the mink was formerly considered hardly worth collecting, a skin selling for about 50 cents; but since the caprice of fashion has brought this fur into vogue, they are worth from \$1.50 to \$2.50 apiece, according to color and quality; the fur is fine, but shorter and less lustrous than that of the pine marten or American sable. It is very generally distributed in North America, from lat. 70° N. to Florida, and from ocean to ocean. Some specimens from the West are larger than the average. In the northern states there is a smaller and blacker mink (*P. nigrescens*, Aud. and Bach.), by some considered a mere variety; the fur is dark and remarkably soft, and considerably more valuable than that of the common mink.—The European mink (*P. lutreola*, Ouv.) is of smaller size, darker colored, with less bushy tail, and the edges of the upper lip white; it is a rare animal, with the same habits as the American species, and its fur is more highly esteemed; indeed it is often sold to the inexperienced for sable, and that of the American mink is generally called by furriers American sable, though the latter belongs to the genus *Mustela* and is properly a marten.

MINNESINGERS (Germ. *Minne*, love, and *Sänger*, singer), a school of German poets which sprang into existence in the latter half of the 12th century, and flourished until near the close of the 18th. Their themes were amatory and heroic, and were treated in much the same manner as those of the troubadours of Provence, though in a more earnest spirit and after a purer ideal conception of love. For an account of the characteristics of the school and its chief exemplars, see GERMANY, LITERATURE OF, vol. viii. p. 218.

MINNESOTA, one of the north-western states of the American Union, and the 19th admitted under the federal constitution, situated between lat. 48° 30' and 49° N., and long. 89° 29' and 97° 5' W., having an extreme length N. and S. of 880 m., and a breadth varying from 188 m. in the middle to 262 m. on the S. line and 337 m. near the N. line; area, 81,259 sq. m., or 52,005,760 acres, being 2.78 per cent. of the total area of the United States. It is bounded N. by British America, the dividing line being formed W. of the Lake of the Woods by the 49th parallel, and E. of that lake by Rainy Lake river, Rainy and other lakes, and Pigeon river; E. by Lake Superior and Wisconsin, from which it is separated by a line drawn due S. from the first rapids in the St. Louis river to the St. Croix river, and by the St. Croix and Mississippi rivers; S. by the state of Iowa; and W. by Dakota, from which it is divided by the Red river of the North, the Bois des Sioux river, Lake Traverse and Big Stone lake, and a line drawn directly S. from the outlet of the last named lake to the Iowa boundary. The state is divided into 68 counties, viz.: Aiken, Anoka, Becker, Benton, Blue Earth, Breckinridge, Brown, Buchanan, Carlton, Carver, Cass, Chisago, Cottonwood, Crow Wing, Decatur, Davis, Dodge, Douglas, Faribault, Fillmore, Freeborn, Goodhue, Hennepin, Houston, Isanti, Itasca, Jackson, Kanabec, Kandiyohic, Lake, Le Sueur, McLeod, Manomin, Martin, Meeker, Mille Lacs, Monongalia, Morrison, Mower, Murray, Nicollet, Nobles, Olmsted, Otter Tail, Pembina, Pierce, Pine, Pipestone, Polk, Ramsey, Renville, Rice, Ripley, Rock, St. Louis, Scott, Sherburne, Sibley, Stearns, Steele, Todd, Toombs, Wabashaw, Waseca, Washington, Watonwan, Winona, Wright. The principal cities and towns are St. Paul, the capital, St. Anthony, Minneapolis, Stillwater, Winona, Red Wing, Hastings, Wabashaw, Lake City, Anoka, St. Cloud, Shakopee, St. Peter, Mankato, Faribault, Rochester, and Chatfield.—According to the census of 1850, Minnesota contained 6,077 inhabitants, of which number 6,038 were white and 39 colored persons. In 1855 the population was estimated to be 68,812. By an act of congress passed Feb. 27, 1857, the secretary of the interior was directed to institute a census of the territory previous to its admission into the Union, and the enumeration thus initiated gave the following results: white persons 149,820 (males 87,895, females 62,425); colored persons 272 (males 144, females 128); total 150,092, or about 2 to the square mile, constituting 82,586 families. The number of legal voters was 49,180, of whom 26,892 were native and 22,898 naturalized. By the U. S. census of 1860 the population in 57 counties is 176,585.—Lying nearly at the centre of the continent, Minnesota occupies the summit of the interior plain of North America, formed by the conterminous basins of the Mississippi, the St. Lawrence, and the rivers flowing into Lake Winnipeg, and at once encloses the head waters

and the navigable limits of the three great converging river systems of the continent. A group of low sand hills in N. E. Minnesota, formed by huge deposits of drifts overlying a local outcrop of the primary and metamorphic rocks, which terminates the Superior basin on the west, forms the "Heights of Land" between the waters which flow respectively into the gulf of Mexico on the south, the Atlantic ocean on the east, and Hudson's bay on the north. The Heights of Land rise by scarcely perceptible slopes from the general level, in no instance higher than 1,680 feet above the sea, which is not more than 600 feet above the average elevation of the country. These hills are commonly flat at the top, varying in height from 85 to 100 feet above the surrounding waters. The principal group of these drift hills is subdivided into several ramifications. A prominent spur extends in a southerly direction from the Itasca crest of the Mississippi for perhaps 150 miles, known as the Leaf mountains and the Coteau du Grand Bois of Nicollet, and forms a low dividing ridge between the waters of the Mississippi and Red rivers. The crest of the dividing ridge between Lake Superior and the Mississippi is not more than 1,400 feet high; and the highest of the trap summits north of the lake is but 1,475 feet. Lake Superior is 641 feet above the sea. With this exception the surface of the country is generally an undulating plain, with an average elevation of nearly 1,000 feet above the sea, and presents a succession of small rolling prairies or table lands, studded with lakes and groves, and alternating with belts of timber. Two thirds of the surface slopes S. E. with the waters of the Mississippi, the northern part of the state being nearly equally divided between the alluvial levels of the Red river valley on the north-west and the broken highlands of the north-east, which are mainly drained by the precipitous streams which flow into Lake Superior and the Rainy lake chain.—The principal rivers are the Mississippi, which originates in Lake Itasca lying in the extreme western elbow of the Heights of Land, and flows S. E., 797 m. of its course belonging to Minnesota, of which 134 forms the E. boundary; the Minnesota, which traverses the lower part of the state in a S. E. and N. E. direction, and falls into the Mississippi after a course through the state of 384 m.; the Red river of the North, which rises in Elbow lake, and, flowing through several lakes, runs in a S. W. direction, then turning to the N. forms the W. boundary for 379 m.; and the St. Croix river, which rises in Wisconsin, forms 129 m. of the E. boundary, and falls into the Mississippi. In the N. E. part is the St. Louis river, which falls into Lake Superior, and is important as the first link in the chain of lakes and rivers of the St. Lawrence system; and in the S. W. are the head waters of the Des Moines. All the rivers have numerous branches. The navigable waters within the state have a total shore line of 2,746 m., and a water line of 1,582 m. Along the banks of the

Mississippi and of some other rivers are high bluffs, forming one of the most interesting and characteristic features of the scenery. Minnesota is distinguished for the number and beauty of its lakes, which present every variety in size, outline, and situation. Their waters are generally sweet and clear, lying on rocky or pebbly bottoms, and abounding in fish. The largest of these lakes are the Lake of the Woods, Rainy, Namekan, Bois Blanc, Vermilion, Swan, Sandy, Winibigoshish, Leech, and Mille lakes in the N. E., Red lake in the N. W., Big Stone, Benton, Sauk, and Swan in the W. and S. W. Many of the lakes have an area of from 100 to 400 sq. m.—Notwithstanding the great area covered by this state, the rock formations it contains, so far as they have been explored, appear to be limited almost exclusively to the azoic and lower protozoic groups; and over the greater part of the state these are concealed beneath the diluvial deposits which make the superficial covering of the boundless rolling prairies. The N. W. coast of Lake Superior is made up of metamorphic slates and sandstones, intermingled with grits of volcanic origin and other bedded traps and porphyries. These are intersected by frequent dikes of greenstone and basalt; and among them are occasional deposits of red clay, marl, and drift. Behind this group are traced westward, along the northern boundary of the state, formations of hornblende and argillaceous slates, succeeded by granitic and other metamorphic rocks. These groups extend S. W. into the central portions of the state. Along the southern boundary the devonian formation is found in the extreme west; the Niagara limestone succeeds this toward the east, and next occurs the Galena limestone, and then the Trenton limestone and the upper or St. Peter's sandstone, which overlies the Potsdam sandstone. These sandstones crop out up the valley of the Mississippi, nearly as far as Fort Snelling, when the lower silurian limestones, which on both sides the river lie behind and over the sandstones, meet in the valley and form the bluffs of the rivers. They are traced up the Minnesota river, curving round and almost reaching the southern boundary of the state again, and cutting off the continuation of the higher groups farther northward. Thus throughout the state there appears to be no room for the carboniferous group, so that no coal may be looked for. The lead-bearing rocks traced from the Iowa line are of little extent, and probably of little importance.—The soil is fertile, $\frac{2}{3}$ of the surface being well adapted to the cultivation of all the cereals and roots of the temperate zone. It is composed generally of a dark, calcareous loam, abounding in organic and saline ingredients, and is retentive of moisture. In climate Minnesota is favored beyond most lands in the same latitude on the continent. The winters are cold, but clear and dry, and the fall of snow is light; the summers are warm, with breezy nights, during which occur most of the rains; and the general

purity of the air and the salubrity of its climate recommend it for the residence of invalids. The country, especially above lat. 46°, is well timbered; pine forests extend far to the N., and birch, maple, aspen, ash, and elm abound. A large forest of hard wood varieties known as the Big Woods, and called Bois Franc by the early French settlers, extends over the central portion of the state W. of the Mississippi, and covers an area of about 4,000 sq. m. On the river bottoms are found basswood, elm, aspen, butternut, ash, birch, maple, linden, balsam fir, and some oaks; and in the swamps tamarack, cedar, and cypress. Among the wild animals are the elk, deer, antelope, bear, wolverene, otter, muskrat, mink, marten, raccoon, and wolf. The buffalo is no longer found E. of the Red river. Of birds, there are the golden and bald eagles, grouse, pheasant, partridge, hawk, buzzard, owl, quail, plover, lark, and many smaller kinds. There are also the pelican, tern, sheldrake, teal, loon, wild geese, wild ducks, and other water fowl. The waters contain pike, pickerel, bass, whitefish, muskellonge, catfish, trout, and other varieties of fish.—Many natural objects of interest are found throughout the state. The Mississippi, studded with islands and bordered by high bluffs, presents a succession of most picturesque scenes. Mountain island, with an elevation of 428 feet; Maiden's rock, celebrated in Indian tradition, on an expansion of the river called Lake Pepin, about 400 feet high; and La Grange mountain on the same lake, are all notable for their picturesque character. St. Anthony's falls, celebrated as much for their surrounding scenery as for the descent of the waters, which have a perpendicular fall of only 16½ feet, are further up the river, and promise from the abundant water power they afford to become a most important manufacturing site. A few miles beyond, between Minneapolis and Fort Snelling, are the Minnehaha falls, a romantic and beautiful cascade with a perpendicular pitch of 45 feet, flowing over a projecting rock which permits a passage underneath. Brown's falls, which have a perpendicular descent of 50 feet, and including the rapids of 100 feet, are situated W. of the Mississippi, on a narrow stream which is the outlet of several small lakes. There are also falls or rapids on the St. Croix, about ¼ m. below which is a noted pass through which the river has forced its way, called the Dalles of St. Croix, and others of less note on various streams. About 2 m. from St. Paul is Fountain cave, an excavation in the white sandstone, with an entrance about 15 feet in diameter opening into a chamber 150 feet long and 20 wide. The cave has been explored for 1,000 feet without reaching the termination.—Until the year 1845 Minnesota was the home of the Indian, the Chippewas and Sioux; and the only representatives of civilization within the country were the trappers and traders, the lumbermen on the St. Croix, and a few missionaries of religion. The succeeding years have seen a tide of immigration

represented by thousands and tens of thousands annually, so that at the present time there cannot be fewer than 200,000 white inhabitants. On June 1, 1850, cultivation extended over 5,085 acres, and 23,846 acres were occupied but not cultivated—together valued at \$161,984; and the value of farming implements and machinery was \$15,981. The crops of 1849-'50 consisted of 1,401 bushels of wheat, 125 of rye, 80,582 of oats, 16,725 of Indian corn, 1,216 of barley, 515 of buckwheat, 21,845 of potatoes, 10,002 of beans and peas, 2,019 tons of hay, &c. The commissioner of statistics for Minnesota estimated the crop of 1859-'60 as follows: 2,500,000 bushels of wheat, 2,000,000 of Indian corn, and 2,500,000 of oats. The number of farms, according to the census of 1860, embracing returns from 57 counties, is 19,075. The live stock in 1860 consisted of 860 horses, 14 asses and mules, 607 milch cows, 655 working oxen, 740 other cattle, 80 sheep, and 784 swine; aggregate value \$92,859. According to the same census there were then in Minnesota 5 manufacturing establishments in which a capital of \$94,000 was invested, and which employed 63 hands. The raw material consumed was valued at \$24,000, and the value of the products of the year was \$57,500. The census of 1860 gives 568 manufacturing establishments. The quantity of land sold by the United States since the establishment of the land system in Minnesota has been as follows: in the year ending June 30, 1850, 1,605.41 acres; 1851, 2,831.74; 1852, 15,058.29; 1853, 5,059.15; 1854, 129,606.86; 1855, 885,595.55; 1856, 1,002,180.67; 1857, 202,010.92; 1858, 482,856.44; 1859, 190,842.57; total, 6,186,111.80 acres. These amounts are exclusive of lands entered by bounty warrants, and also of school, university, railroad, swamp, and donation lands which have accrued to the state under various acts of congress.—A considerable trade is carried on by steamers on the Mississippi, and a regular communication maintained with the East via Milwaukee and Chicago, and with the gulf states by way of St. Louis, &c. The arrivals of steamboats at St. Paul in 1844 were 41; 1845, 48; 1846, 24; 1847, 47; and 1848, 63. To this period the sole occupation of these was in the fur and Indian trade. In 1849 and subsequent years the arrivals were as follows:

| Years. | No. of arrivals at St. Paul. | River closed by ice. | Length of season. |
|-----------|------------------------------|----------------------|-------------------|
| 1849..... | 95 | Dec. 7 | 243 days |
| 1850..... | 194 | " 4 | 239 " |
| 1851..... | 119 | Nov. 8 | 233 " |
| 1852..... | 171 | " 18 | 216 " |
| 1853..... | 200 | " 30 | 233 " |
| 1854..... | 254 | " 27 | 228 " |
| 1855..... | 560 | " 30 | 217 " |
| 1856..... | 837 | " 10 | 219 " |
| 1857..... | 1026 | " 14 | 196 " |
| 1858..... | 1068 | " 15 | 226 " |
| 1859..... | 808 | " 27 | 222 " |

In this table are included arrivals from ports within as well as without the state. The principal points of connection in the river trade without the state are La Crosse, Prairie du Chien,

Dunleith, and St. Louis, from which came $\frac{1}{4}$ of the arrivals in 1859; the remainder came chiefly from the Minnesota river, on which a smaller class of boats are employed. A small steamboat runs to Taylor's falls on the St. Croix, and above St. Anthony falls on the Mississippi to St. Cloud. Recently an important trade has sprung up between St. Paul and the Salkirk settlement on the Red river of the North, a community of 10,000 souls, consisting of farmers, hunters, and traders, connected with the Hudson's bay company. Until 1859 this trade, which is constantly increasing, was carried on by means of carts overland, of which 400 or 500 arrived annually at St. Paul. In that year, however, a small steamboat was placed on the Red river, and with the improved means of conveyance the Hudson's bay company have chosen this route for the transportation of their annual supplies, in preference to the old canoe route to Hudson's bay. In 1859 there were engaged in the commerce of Lake Superior 9 steamers and 20 sailing vessels, with a total burden of 16,200 tons. The chief commercial products of the country are wheat and oats, in the yield and quality of which it excels most other states; corn, of which it is less productive; potatoes, turnips, and other field roots; dairy products, wool, cattle, hides, furs from the north-west, pine lumber and cranberries from the north-east, and ginseng from the central forests. The exports from Aug. 20, 1859, to July 15, 1860, are stated as follows: wheat, 1,050,685 bushels; oats, 585,500; other grains, 57,100; lumber, 53,490,938 feet; logs, 71,000,000 feet; laths, 21,886,000; shingles, 6,763,000; ginseng, 203,000 lbs.; furs, value, \$160,000; cranberries, 10,300 bushels, &c.—The means of internal transit are as yet mostly limited to the rivers, affording 1,532 m. of navigation; but several roads have been built by the general and local governments, and a spirit of railroad enterprise has lately sprung up among the people. Minnesota has obtained grants of land amounting to 4,899,141 acres from congress to aid in the construction of 1,270 miles of projected railroad, on the following lines: Minnesota and Pacific railroad (main line), from Stillwater *via* St. Paul and St. Anthony to Breckinridge, 220 m., with a branch from St. Anthony *via* Anoka, St. Cloud, and Crow Wing, to St. Vincent on Red river, 400 m.; Minnesota valley railroad, from St. Paul and St. Anthony (uniting at Shakopee City), *via* South Bend, to the southern boundary in the direction of the mouth of the Big Sioux river, 190 m.; Minneapolis and Cedar valley railroad, from Minneapolis *via* Faribault to the S. boundary near Cedar river, 112 m.; Minnesota transit railroad, from Winona *via* Rochester and St. Peter to the Big Sioux river, S. of the 45th parallel, 268 m.; Root river railroad, from La Crosse to a junction with the transit railroad at Rochester, 79 m. As a further aid to the construction of these roads, a conditional loan of state credit was authorized by law, in pursuance of which bonds

to the amount of \$2,275,000 were issued and applied to grading on the various lines.—On Jan. 1, 1860, Minnesota contained 6 banks, the condition of which was as follows: Loans and discounts, \$107,198.80; due from brokers, \$45,088.20; stocks, \$225,000; specie, \$14,712.10; loss and expense account, \$4,510.78; cash items and real estate, \$7,786.91; bills of other banks, \$27,856; due from other banks, \$18,146.86; total resources, \$450,242.10. Capital, \$309,000; circulation, \$34,481; due depositors, \$58,836.88; due other persons, \$47,924.27; total liabilities, \$450,242.10.—Ample provisions have been made for education, viz.: a grant by congress of two sections of every township, or 2,886,000 acres in all, and a tax of $\frac{1}{4}$ of 1 per cent. on all taxable property, amounting in 1859 to \$89,000, for the support of common schools; a grant of 72 sections for a state university; and a state appropriation of \$15,000 in aid of 8 state normal schools. In 1859 the number of persons of school age was 42,258, and of school districts 1,016. There are union or high schools in all the principal towns, and common schools wherever the population is sufficiently compact. In 1859 a law was passed for the establishment of a deaf and dumb asylum at Faribault, and in 1858 of a state agricultural college at Glenoove.—The present constitution of Minnesota was adopted Oct. 13, 1857, and the state government was organized May 22, 1858. The qualifications for voters are, that they be free white males, 21 years of age, who are or have declared their intention of becoming citizens of the United States, and who have resided in the United States 1 year, and in the state 4 months next preceding. Indians and persons of mixed white and Indian blood, who have adopted the language, customs, and habits of civilization, are also allowed to vote in any district in which they have resided for the 10 days next preceding. The legislature consists of 37 senators elected for 2 years, and 80 representatives elected for 1 year. They must be qualified voters and residents in the state 1 year, and in their respective districts 6 months next before the election. The executive consists of a governor (salary \$2,500), lieutenant-governor (\$6 a day as president of the senate), secretary of state (\$1,500), treasurer (\$1,000), and an attorney-general (\$1,000), all elected for 2 years, and an auditor (salary \$1,000) elected for 3 years. The judiciary comprises a chief justice and 2 associates forming the supreme court, 6 judges of district courts, and a judge of probate and justices of the peace in each county. All judges are elected, those of the supreme and district courts for 7 years, and the others for 2 years. The revenue of the state is derived chiefly from taxation, and in 1859 amounted to \$177,822. The valuation of property subject to tax in 1850 was \$306,437; and in 1859, \$35,564,492. The state has an absolute debt of \$250,000, and contingent liabilities to the amount of \$2,275,000, contracted on account of a loan of credit to railroad companies.—Though of so recent settlement, Minnesota has long been the

seat of a considerable traffic with the Indians, and of missionary enterprise. As early as 1680 Hennepin and La Salle penetrated these wilds, followed by La Hontan and Le Sueur, and in the last century by Carver; and within the present century this region has been thoroughly explored by Pike, Long, Keating, Nicollet, Schoolcraft, Owen, and others. But it was not before 1812 that the United States had any authority within the limits of Minnesota. In 1816 a law was passed excluding foreigners from the Indian trade; and the military post of Fort Snelling was established in 1819. In 1837 a small tract of country between the St. Croix and Mississippi was ceded by the Indians to the United States, and lumbering operations commenced upon the St. Croix. The territory of Minnesota was established by an act of congress passed March 3, 1849, and the government was organized in June. It embraced nearly twice the area of the present state, its western limits extending to the Missouri and White Earth rivers. Up to this period the country was occupied almost entirely by Indians; but a small civilized population of whites and half-breeds had grown up around the trading posts and mission stations, amounting in 1849 to 4,857 souls. In 1851 the Sioux ceded to the United States all their lands in the territory W. of the Mississippi to the Big Sioux river. The population increased so rapidly after this, that in 1857 application was made for admission into the Union. The act authorizing the formation of a state government passed congress Feb. 26, 1857, and the state was admitted into the Union on May 11, 1858, with the boundaries above described. That portion of the state lying on the E. side of the Mississippi originally belonged to the country termed the "Territory north-west of the Ohio," and had the ordinance of 1787 been fully complied with would have been included in the 5th state (Wisconsin) formed from that region. This section comprises an area of 22,336 square miles. The part of the country lying W. of the Mississippi, and embracing more than two thirds of its area, was originally a portion of Louisiana, and came into the possession of the United States in 1803; and before it was included in Minnesota it had been a part of the territory of Missouri, and subsequently of Iowa.

MINNESOTA, or ST. PETER'S, a river of Minnesota, having its source in a series of lakes between lat. 45° and 46° N., and pursuing a S. E. course for about 300 m. to its confluence with the Blue Earth; then turning N. E. it flows in that direction for about 120 m., falling into the Mississippi at Fort Snelling. Its course is principally in the valley lying between the Coteau du Grand Bois and the Coteau des Prairies. For its whole distance from Big Stone lake it has a fall of only 220 feet. It is navigable for steamers about 40 m. to a point where at low water a ledge of rocks obstructs further progress; but ordinarily small boats can ascend to Patterson's rapids, 295 m. from its mouth.

MINNOW, the common name of many small cyprinodont fishes, of the genera *Fundulus* (Lacép.) and *Hydrargyra* (Lacép.). In *Fundulus* the upper surface of the head is flattened; fine card-like teeth upon the jaws, and short ones on the posterior part of the hyoid arch, with opposite velvet-like patches on the roof of the mouth; no teeth on palate or vomer; branchial rays 5; dorsal opposite the anal, and caudal rounded; upper surface and sides of head covered with scales. The common minnow, or "cobbler" of the young smelt fishers (*F. pieulentus*, Cuv. and Val.), is from 1 to 5 inches long; the females are of a uniform brown color; the males with lighter intervals on the sides arranged like transverse bands, the dorsal and anal with black dots, and anal slightly emarginated posteriorly, mouth protractile, and upward when closed. This abounds about the salt marshes of the northern and middle states, and is caught in large numbers in hand nets as bait for other fish, particularly smelts. The banded minnow (*F. nigrofasciatus*, Cuv. and Val.) is less common; it is 2 or 3 inches long, yellowish green above with numerous black dots, silvery white below; 10 to 14 black bars across the sides, widest in the males; found in New England. The barred minnow (*F. multifasciatus*, Cuv. and Val.) is about 8 inches long, olive-green above, bluish gray below, with the lighter sides marked transversely with numerous bluish bands with darker minute dots; found in New England and New York.—The yellow-bellied minnow (*Hydrargyra flavula*, Storer) is from 1 to 5 inches long; the female is yellowish green above, lighter on the sides, and white beneath, with from 1 to 5 longitudinal interrupted black bands extending along the sides from the gill covers to near the tail, where there are 3 or more indistinct transverse bands. In this genus the head is more flattened, and the branchial rays are 6. It is found in southern New England and New York.—The cyprinoid black-nosed dace (*Argyreus atronotus*, Heck.) is sometimes called brook minnow. The British minnow or minim (*Leuciscus phoxinus*, Cuv.) rarely exceeds 3 inches in length; it is generally found in the same streams with trout, swimming in shoals.

MINORCA, or MENORCA (anc. *Balearis Minor*), the second in size of the Balearic islands, lying 24 m. E. N. E. from Majorca, and about 130 m. S. E. from Barcelona, between lat. 39° 47' and 40° 21' N., and long. 8° 50' and 4° 23' E.; greatest length 38 m., greatest breadth 13 m.; area, about 300 sq. m.; pop. about 44,000. The coast is indented on every side with small bays, several of which form excellent harbors. The surface is rugged, and rises gradually toward the centre, where it attains, in Monte Toro, an elevation of nearly 5,000 feet. The climate is very hot in summer and cold in winter, and the soil is rather sterile. Iron, lead, copper, and marble are found. The inhabitants are almost entirely engaged in agriculture, fishing, and commerce. Minorca is of great commercial

importance in the Mediterranean trade, and the capital, Port Mahon, possesses an excellent harbor. (See BALEARIC ISLANDS.)

MINORITES. See **FRANCOISANS.**

MINOS, in Greek mythology and legends, a Cretan hero and lawgiver. According to Homer he was the son of Jupiter by Europa, brother of Rhadamanthus, and father of Deucalion and Ariadne. The logographers make him also the brother of Sarpedon and husband of Pasiphaë. Some later writers distinguish two kings of the name, but only one Minos was known to Homer, Hesiod, or the poets and historians to the time of Aristotle. To obtain possession of the throne of Crete, he affirmed that the gods granted to him every thing for which he prayed. He accordingly prayed that a bull might come forth from the sea, and promised to sacrifice it to Neptune. The bull appeared, and he obtained the kingdom; but, admiring the beauty of the animal, he sacrificed another in its place. Thereupon Neptune afflicted his wife Pasiphaë with a monstrous passion for the bull, for the gratification of which the inventor Dædalus contrived means, and she became the mother of the Minotaur, a creature with the body of a man and the head of a bull, which was imprisoned by Minos in the Cretan labyrinth. Minos acquired great maritime power, conquered the Ægean islands, made war upon Athens, and compelled the Athenians to send to Crete periodically a tribute of 7 youths and 7 maidens to be devoured by the Minotaur. Theseus with the aid of Ariadne at length slew the monster and abolished the tribute. In a subsequent attempt to conquer Sicily Minos failed and perished. After his death he was constituted judge in Hades to settle their disputes, but without authority to determine the reward or punishment for the previous lives of the dead. The Cretans ascribed to him their political and legal institutions.

MINOT, GEORGE RICHARDS, an American historian and jurist, born in Boston, Dec. 28, 1758, died Jan. 2, 1802. He was graduated at Harvard college in 1778, and subsequently practised law in Boston. He was successively clerk of the Massachusetts house of representatives, secretary of the convention which ratified the federal constitution, judge of probate for the county of Suffolk, and judge of the municipal court of Boston, which last office he filled at the time of his death. His publications consist of an oration on the Boston massacre, delivered in 1782; a "History of Shays's Rebellion" (8vo., 1788); "Eulogy on Washington" (1800); and a "History of Massachusetts Bay" from 1748 to 1765, with an introductory sketch of the period from the settlement of the country. Of the last named work, which is a continuation of that of Gov. Hutchinson, the 2d volume was published after his death.

MINOTAUR. See **MINOS.**

MINOT'S LEDGE. See **LIGHTHOUSE.**

MINSK, a S. W. government of European Russia, bounded N. by Vitebsk, from which it is separated by the Dûna, E. by Mohilev and

Tohernigov, S. by Kiev and Volhynia, and W. by Grodno and Wilna; area, 84,880 sq. m.; pop. in 1856, 988,188. The territory of Minsk is a vast plain, over which are scattered a few hills of moderate elevation. In the N. and E. there are large forests, and toward the S. and S. W. extensive marshes. The principal rivers are the Dnieper (which partly bounds it on the E.), Niemen, Pripetz, and Beresina. The climate is very severe in winter, but pleasant in summer. The soil is dry in the N. and to some extent fertile; in the S. mostly wet and marshy. Agriculture is the principal occupation. Minsk is divided into 10 circles, and was formerly a part of the Lithuanian provinces of Poland.—**MINSK**, the capital, is situated on the Swislocz, about 150 m. S. E. from Wilna; pop. 25,000, a large part of whom are Jews. It is the seat of a Greek prelate and a Roman Catholic bishop. The nuns of Minsk were subjected to persecution by the emperor Nicholas in 1840.

MINSTREL, one of a class of men in the middle ages, who gained a livelihood by the arts of poetry and music, singing to the harp their own verses, or the popular ballads and metrical histories of the time. They sometimes accompanied their music with mimicry and action, so that they were often called *mimi* and *histriones*. The term minstrel is of Norman origin, and was introduced into England with the Norman conquest. Edward II., Henry V., and Henry VI. showed great regard for minstrels; but the reign of Richard Cœur de Lion was their golden age. When Henry V. set out on his great expedition to France, 18 minstrels, with an allowance of 12d. a day each, accompanied him. But from the reign of Edward IV. their art seems to have declined. Toward the close of Elizabeth's reign a statute was enacted, by which wandering minstrels were punished along with rogues, tinkers, peddlers, vagabonds, and beggars.

MINT (*mentha*, from *Mintha*, a nymph changed into this plant), commonly understood to signify, in botany, what we call spearmint or common mint (*M. viridis*, Linn.). It is a native of Europe, though found about moist ground and waste places in the United States, having strayed from gardens and fields where it has been cultivated. In appearance it is handsome, cleanly, of a deep green color, with an erect stem 1 to 2 feet high, furnished with oblong-lanceolate, subsessile, acutely cut, serrate leaves, and ending in slender, tapering spikes of pale, purple-corolla flowers. The fresh leaves when bruised are employed as a sauce, and in the preparation of a beverage known as mint julep. There are several species of *mentha* to which is affixed some descriptive title, and which are in this sense mints, such as the peppermint (*M. piperita*, Linn.), likewise naturalized in many places in America, though indigenous to Europe; also others not commonly seen among us, but known abroad, such as the *M. rotundifolia*, *aquatica*, and *pulegium*, having similar properties as stimulating medicines; but peppermint is by far the most pleas-

ant, and is chiefly used to relieve nausea or to cover the unpleasant taste of other medicines. This mint is largely cultivated, especially in the state of New York, for the manufacture of the oil of peppermint, of which great quantities are consumed by confectioners in flavoring candies, lozenges, &c., and by druggists and liquor dealers in preparing essences, cordials, and the like. Essence of peppermint is a solution of the oil in alcohol, of different degrees of strength. Another species possessing the singular odor of decaying cheese is known as the corn mint (*M. arvensis*), having, unlike the others, hairy stems, petioled ovate or oblong leaves, and globose, remote whorls of flowers. This is likewise considered an adventitious plant from Europe, and is rarely met with, occurring in fields in Pennsylvania and Ohio. The wild mint (*M. Canadensis*, Linn.) is not uncommon in wet grounds by the sides of brooks to the northward, and extending from New England to Kentucky. It has whitish, hairy, square stems, rising upward from 1 to 2 feet high; its leaves are oblong, tapering at both ends, supported on footstalks; its flowers in regular axillary whorls, and having pale purple corols. In taste and properties the species is similar to pennyroyal. It is considered identical with the *M. borealis* of Michaux. The mints are readily raised by planting out the running rootstocks in rich but moist ground. They belong to the natural family of *labiata*. Several species of *pycnanthemum* common to the United States are called horse mints; they are handsome herbs, with perennial roots, soft downy foliage, and rather small, whitish blossoms, all having pungent, aromatic, and mint-like flavors, and growing generally in dry soils or on rocky places.

MINT (Sax. *mynet*, money), a place where money is coined. To make the money of a country, and declare the same a legal tender in the payment of debts, is necessarily a prerogative of its government. Nothing short of the public faith can afford a sufficient guaranty of the integrity of the standard by which all values are to be measured. Each country has to provide therefore for a national currency; and this is usually done through the agency of a national mint. In early Saxon and Norman times, almost every important town in England could boast a mint; but as the commerce of the country became systematized and the modes of communication improved, these local mints became unnecessary. From the time of William the Conqueror until 1811 the great bulk of the coinage was done in the tower of London; and since that time the royal mint on Tower hill has been found adequate for the coinage of the entire kingdom. In France, previous to 1772, there were 81 mints; at that date the number was reduced to 18. At present, although mints still exist at Paris, Bordeaux, Lille, Lyons, Rouen, and Strasbourg, the coinage is almost wholly done at Paris; the tendency being as in England to concentrate the coinage operations of the country in its commercial metro-

polis.—The early methods of coining money were exceedingly imperfect. The metal, having been brought to the required standard of fineness, was melted and cast into small bars, which were reduced to thin plates under the hammer. Square pieces cut from these plates were rounded at the forge, and then by means of rude dies—one fixed like an anvil to a block, and the other held in the hand and struck with a mallet like a punch—the round lump of metal was flattened and coined at the same time. The difficulty of thus placing the two dies exactly opposite suggested occasional improvements; but it was not till about the middle of the 16th century that the forge and hammer gave place in France and England to the mill and screw, a French invention by which the bars were reduced to their proper thickness by rolling, and the pieces were coined by the pressure of a screw. In the British mint screw presses, impelled by steam, continue to be used at the present day; while in France, the United States, and some other countries, the lever presses of Thonnelier have been substituted.—The mint establishment of the United States consists of the principal mint at Philadelphia and 5 branches, located respectively at New Orleans, La.; Charlotte, N. C.; Dahlonega, Ga.; San Francisco, Cal.; and New York city, the last named being styled an assay office. The mint was established by act of congress of April 2, 1792, at Philadelphia, which was then both the seat of government and the commercial metropolis of the country. It was not fairly in operation until Jan. 1795. The branch mints at New Orleans, Charlotte, and Dahlonega were established by the act of March 3, 1835, and commenced operations in 1838, the one at New Orleans being for the coinage of gold and silver, and the other two for gold only. The branch mint at San Francisco, for the coinage of gold and silver, was established by act of March 3, 1852, and went into operation in 1854. The U. S. assay office at New York, established by act of congress of March 4, 1853, also commenced operations in 1854. The functions of the assay office are the same as those of the branch mints with the single exception of coining. Gold and silver bullion is received on deposit, weighed, melted, assayed, and refined, on precisely the same terms as at the Philadelphia mint, and returns are made either in coins or stamped bars at the option of the depositor. That portion of the bullion, however, which is paid for in coins, or an equivalent amount, must necessarily be sent to the mint at Philadelphia, to be coined and returned. These branch establishments are managed by superintendents appointed by the president of the United States, and the general direction of the business of the branches is under the control and regulation of the director of the mint at Philadelphia, subject to the approbation of the secretary of the treasury. The whole mint establishment, thus constituted, is itself a bureau of the treasury department, and its operations

are annually reported to congress through the secretary of the treasury, and made public.—The course of business at the mint and branches is briefly as follows. Deposits of bullion, not less than \$100 in value, are receivable by the treasurer, who weighs the same in the presence of the depositor, and gives him a receipt therefor expressing the weight in troy ounces. Each deposit is kept separate during the process of melting and assaying, and until its precise value is determined. This is ordinarily accomplished in 2 or 3 days, when, on presentation of the original receipt, the net proceeds are paid to the depositor or his order. At the time of payment, the treasurer furnishes the depositor a "memorandum" exhibiting the weight of his bullion before melting and after melting, its fineness and value, the amount of silver contained in a gold deposit, and *vice versa*, the "deductions" for parting, coinage, or bars, and the net amount payable. The charges made to depositors are for parting when gold and silver are combined, for refining and toughening when required, for coinage or fine bars according as a deposit is paid in one or the other. The law provides that these charges shall be fixed from time to time by the director with the concurrence of the secretary of the treasury, so as not to exceed the expense to the mint of the labor and materials employed. The existing charges for parting on gold bullion of the ordinary range of fineness, at Philadelphia, New York, and New Orleans, is 5 cents per oz. gross; at Charlotte and Dahlonega, 12 cts.; and at San Francisco, 14 cts. The coinage charge at all the mints is 50 cts. per \$100, and for fine gold bars 6 cts. per \$100. The charges for refining and toughening depend upon the condition of the metal deposited.—The organization of the several mint establishments is essentially the same. The officers are a director (or superintendent), a treasurer, an assayer, a melter and refiner, a coiner, and at the principal mint only an engraver. To these officers, as well as the clerks and workmen, are paid salaries or wages regulated by law, for which annual appropriations are made by congress. A portion of the incidental expenses are covered by the charges on deposits; but no commissions or perquisites of any kind are enjoyed by any one belonging to the establishment. The expenditures of the mint establishment for the fiscal year ending June 30, 1859, were \$766,152.11.—The various processes employed in the mint, particularly in the coinage department, cannot be minutely described without the use of diagrams. An attempt will be made, however, to give the reader a general understanding of the subject. Each deposit of gold or silver, when received by the treasurer as already described, is properly numbered and sent to the deposit-melting room to be melted and cast into one or more bars. The object of this melting is to bring the metal into a homogeneous state, so that an assay piece taken from it shall fairly represent the mass. This being done,

the deposit remains in the custody of the treasurer. The assayer, operating upon a small but definite quantity by weight of the assay piece which he has taken, determines, by an exceedingly delicate chemical analysis, the proportion of gold or silver or both which it contains, and reports the result to the treasurer. The fineness thus reported, and the weight of the deposit after melting, are the data for calculating its value and adjusting the claim of the depositor. Deliveries of bullion, composed of these various deposits, are made from time to time by the treasurer to the melter and refiner, and are charged to him in account. It is his province to subject them to the necessary processes for refining them, and to convert them into ingots of standard metal, 900 thousandths fine, suitable for the fabrication of coins. The method of refining or parting in use in the mints of the United States is the nitric acid process, and consists in the dissolving of the silver contained in gold by nitric acid, and its subsequent precipitation by a solution of common salt. The chloride of silver thus obtained is reduced to fine silver by the action of sulphuric acid and granulated zinc. Both the gold and silver, when recovered from the parting process, are in the form of a fine powder, and in appearance wholly unlike those metals as ordinarily seen. They only require to be melted, however, to show what they are. From the fine gold and silver thus obtained, by the addition of the requisite amount of copper for alloy, the melter and refiner makes up pots of standard metal, and casts the same into ingot moulds of the sizes required for the coins which are to be made. When these ingots have been assayed by the assayer and certified by him to be of standard fineness, they are delivered by the melter and refiner to the treasurer, by whom they are credited in account. The account of the melter and refiner is settled annually by his returning to the treasurer all the metal in his possession, and he is entitled by law to an allowance for necessary wastage, provided it shall not exceed $\frac{1}{100}$ of the whole amount operated upon during the year. This limit is very seldom reached. We have not the means of giving the wastage of the mint or branches. At the assay office at New York, from the commencement of operations in Oct. 1854, to Dec. 31, 1859, the melter and refiner's wastage on gold was less than $\frac{1}{10}$ part of the legal allowance, and on silver $\frac{1}{10}$ part. The amount in value by which his actual wastage fell short of the legal limit during this period of 5 years was \$191,151.55. A statement of the experience of the mint would doubtless show results equally favorable. The ingots of standard metal delivered by the melter and refiner to the treasurer, as above described, are next delivered to the coiner. An ingot is a flat bar of metal about 12 inches long, $\frac{1}{2}$ of an inch thick, and from $\frac{1}{4}$ to $1\frac{1}{4}$ inch wide. By means of powerful but accurately constructed rollers, driven by steam, the ingots are rolled out into thin strips or ribbons of the proper thickness for the coin designed to be made. In

the process of rolling, the strips require to be occasionally annealed in furnaces constructed for that purpose. After the final rolling, the strips are taken to a drawing bench, in which they are drawn, like wire, through a steel gauge to make them straight and of uniform thickness. Next comes the cutting press—a vertical steel punch working accurately into a matrix or round hole in a steel plate of the size of the planchet required, and operated rapidly by an eccentric—under which the strips are fed by hand, and the disks or planchets falling through the hole in the plate are caught in a box below. The gold planchets are subjected before coining to a careful adjustment by weight. This is done by females, whose delicacy of touch fits them admirably for this service. Seated at a long table, each one has a balance before her and a flat file in her hand; and the gold planchets are successively tried against a counter weight. Those that are too light are thrown aside to be remelted, and those that are too heavy are brought to the proper weight by moving the file lightly round the edge. The planchets thus adjusted are now ready for the milling machine, an exceedingly simple but beautiful piece of mechanism of American invention, by which the planchets, as rapidly as they can be fed by hand into a vertical tube, are caught one by one edgewise, and caused to rotate in a horizontal plane in a channel formed on one side by a revolving wheel, and on the other by a fixed segment of corresponding curve, but slightly nearer the wheel at one end than at the other. The effect is that each piece in passing through this narrowing channel has its edge evenly crowded up into a border or rim. After being annealed and cleaned or “whitened,” the planchets are ready for the coining press. The coining press in use in all the mints of the United States, as already mentioned, is constructed after the plan of the French lever press invented by Thonnelier. Without drawings a minute description of this beautiful machine would be impossible. Suffice it to say that the pressure upon the die, formerly accomplished by the screw, is in this machine effected by a lever moved by a crank and operating a strong toggle joint. The planchets being fed by hand into a tube or hopper in front of the machine, the lower piece in the tube is seized by steel feeders and carried forward and lodged in the collar between the upper and lower dies. At the same moment the lever is descending, and by the time the planchet is in position the toggle joint, brought into a vertical position, imparts to the piece a pressure which within the narrow limits of its motion is almost incalculable. The immediate relaxation of the joint causes the upper die to be lifted, when the feeders, coming up with a second planchet, push away the one already coined, and cause it to slide over a sloping channel into a box below. The planchet before being struck is slightly less in diameter than the steel ring or collar into which it drops; but the pressure upon the dies is such as to cause the piece to expand into

the collar and take from it the reeding or fluting of its edge. The coins, after being carefully inspected by the coiner to eliminate defective pieces, are counted and put up in bags, and delivered to the treasurer, by whom the coiner is held to the same accountability as the melter and refiner. The counting is performed with great accuracy and despatch by a counting board of very ingenious construction, invented by the late Rufus Tyler, coiner of the New Orleans branch mint, and purchased by government for the use of the mints. The dies used in all the mints of the United States are made under the supervision of the engraver of the principal mint. The production of original dies cut by the engraver's hand in steel is a work of great labor, and it would be impossible in this manner to supply the dies necessary for the coinage of the country. A very ingenious process is employed for multiplying them. The original dies, being carefully finished and hardened, are used simply to strike copies in softened steel, which is done by repeated blows under a powerful screw press. As the devices upon the original dies were sunk, these copies will be in relief. To prepare dies for coinage, therefore, this hardening and copying process must be repeated. The durability of the dies used in coining depends mainly upon the skill with which the softening and hardening have been accomplished. A rigid system of registration and accountability is necessary to keep the old dies from falling into improper hands.—In the various operations of the mint, particularly in those of the melter and refiner's department, a large amount of precious metals will be temporarily lost by becoming absorbed in the melting pots and fluxes and mixed with the ashes and *débris* of the furnaces. These materials are carefully gathered up, and the gold and silver extracted from them by various methods. This part of mint operations has been recently much simplified and cheapened by a sweep-washing machine invented by E. N. Kent, the melter and refiner of the assay office at New York, and purchased by congress for the use of the mints. Formerly the sweepings of the mints, even after a most laborious process of hand-washing, contained gold and silver of the value of from 50 cts. to \$1 per pound. At present, as issued from the assay office, their average value does not exceed 7 cts. These sweepings are sold in the market to smelters.—From a humble origin in 1792, the mint of the United States has in 68 years attained to gigantic proportions. The various and complicated enactments of congress respecting the mint and coinage were mainly superseded by the admirable mint law of Jan. 18, 1837, drawn up by the late director Dr. Robert M. Patterson, under whose direction also most of the existing improvements in machinery were introduced, and the capacity of the mints developed from a coinage of \$5,000,000 to \$63,000,000 per annum. The directors of the mint since its organization have been as follows: 1, David

Bittenhouse of Pennsylvania, July, 1792, to July, 1795, previously treasurer of Pennsylvania; 2, Henry Wm. De Saussure of Charleston, S. C., July 11 to Oct. 28, 1795, afterward chancellor of South Carolina; 3, Elias Boudinot of New Jersey, Oct. 1795, to July, 1805, previously president of congress under the confederation; 4, Robert Patterson of Philadelphia, July, 1805, to July, 1824, vice provost of the university of Pennsylvania, and president of the American philosophical society; 5, Dr. Samuel Moore of Pennsylvania, July, 1824, to July, 1835, member of congress from Bucks co., Penn.; 6, Dr. Robert M. Patterson of Philadelphia, July, 1835, to July, 1851, professor of mathematics in the university of Pennsylvania, of natural philosophy in the university of Virginia, and president of the American philosophical society; 7, Dr. George N. Eckert of Pennsylvania, July, 1851, to April, 1853, member of congress from Lebanon co., Penn.; 8, Thomas M. Pettit of Philadelphia, April to June, 1853, judge of the district court of Philadelphia; 9, James Ross Snowden of Pennsylvania, June 1853 (present incumbent), previously speaker of the house of representatives of Pennsylvania, treasurer of Pennsylvania, and treasurer of the mint. (For some notice of colonial mints, see COINS.)

MINUCIUS FELIX, MARCUS, a Latin Christian writer, belonging, according to St. Jerome, to the first half of the 8d century. He was a native of Africa, but removing to Rome, became distinguished as an advocate before his conversion to Christianity. He is now only remembered as the author of an apology for Christianity, entitled *Octavius*, in which Octavius, a Christian convert, and Oscilius, a pagan, discuss the relative merits of their respective religions. In this dialogue, Minucius defends the Christians from the calumnies then in circulation against them, while he exposes the licentious practices of the pagans, giving much information concerning the manners and customs of the times. It is, says Neander, "a felicitous and dramatic representation seized from the life, replete with good sense, and pervaded by a lively Christian feeling." It was at one time supposed that *Octavius* formed part of Arnobius's treatise *Adversus Gentes*; but Baldwin, in 1560, corrected the mistake. Editions of the dialogue were published at Leyden in 1709, and at Cambridge, Eng., in 1712; and it has been translated into French and German, and into English in Reeves's "Apologies of Justin Martyr," &c., vol. ii. A work called *De Fato*, now lost, was also ascribed to Minucius, probably without cause.

MINUET (Fr. *menuet*), a dance of a graceful and stately character, which had a celebrity in the last century equal to that at present enjoyed by the quadrille, the waltz, the polka, and other popular modern forms of dancing, but which is now rarely practised except on the stage. It is supposed to have originated in the French province of Poitou, and to have made its ap-

pearance in the latter half of the 17th century. The name has been derived from *menu*, "little," the steps of the dance being short. The time regulating the movements of the minuet consists of 2 strains or parts, of 8 bars each, in 3-crotchet time, both of which from being repeated are called *reprises*.—The minuet or *minuetto* has also been effectively employed by composers as an exclusively musical movement in symphonies, quartets, &c. In this use the 2 strains consist of 16 bars each, and after being repeated are succeeded by a trio, after which the minuet is again played through somewhat more quickly. The time of this movement, which is of German origin, is an *allegro*, and in the second performance of the minuet it is accelerated to *presto*.

MINUTE (Lat. *minutum*), the space of time equal to the 60th part of an hour; also used to denote a portion of the arc of a circle, and as a measure of angles. When the circumference of the circle is divided into 24 hours, the minute is $\frac{1}{1440}$ part of the circle. When the circle is divided into 360°, the minute is the 60th part of a degree, consequently equal to $\frac{1}{21600}$ of the circumference. To distinguish these two measures, the former is called a minute of time, the latter a minute of arc; 15 minutes of arc being equal to one minute of time, and 4 minutes of time to a degree.

MINUTOLI, HEINRICH MENU VON, baron, a German traveller and archæologist of Italian descent, born in Geneva, May 12, 1772, died near Lausanne, Sept. 16, 1846. He entered the Prussian army at an early age, was wounded during the campaign on the Rhine in 1793, and made tutor of Prince Charles and major-general. In 1820 he led a scientific expedition to Egypt under the patronage of the Prussian government. He intended to visit the ruins of Cyrene, but the faithlessness of his Arab guides compelled him to relinquish this project and to confine his journey to Cairo, Thebes, and Assuan, whence he returned to Alexandria, reaching Berlin in Aug. 1822. The architect Liman, the naturalist Hemprich, and 7 of his other companions had died on the journey, and a great portion of his collection was lost by shipwreck. The remaining part of it was purchased by the king of Prussia. Minutoli published a narrative of his travels under the title of *Reise zum Tempel des Jupiter Ammon und nach Ober-Aegypten*, and wrote various historical and archæological works and essays on a great variety of subjects.—His wife, WOLFERDINE, who still lives in Berlin, accompanied him to Africa, and wrote in French *Souvenirs d'Egypte* (Paris, 1826; German translation, Leipsic, 1829).—JULIUS VON, son of the preceding, born in Berlin in 1805, has officiated since 1851 as Prussian consul-general for Spain and Portugal in Madrid, and has published, beside other works, *Spanien und seine fortschreitende Entwicklung* (Berlin, 1852).

MIOCENE, one of the groups into which the tertiary formation is divided by Lyell, intermediate between the eocene below and the pliocene

above—an arrangement founded on the proportional number of fossil shells these divisions severally contain. The name is derived from the Gr. *μειον*, less, and *καινος*, recent, and is intended to express a minor proportion of recent species. The strata of which it consists are chiefly beds of clay and marls more or less made up of organic remains, and sands sometimes consolidated into sandstones. For the nature of the fossil remains and the distribution of the formation, see GEOLOGY, vol. viii. p. 160.

MIRABEAU, GABRIEL HONORÉ DE RIQUETTI, comte de, a French political orator and publicist, born on his father's estate of Bignon, near Sens, March 9, 1749, died in Paris, April 2, 1791. A huge-headed infant who had come into the world with a pair of grinders, one foot twisted, and tongue-tied, disfigured when 8 years old by confluent small pox, he grew up "as ugly as the nephew of Satan," giving such signs of bodily strength, passionate temper, power of mind, and impetuosity, as to be styled by his father "a monster physically and intellectually." He was, however, quite accessible to reason and kindness; but his father, who called himself the "friend of men," and was in fact a domestic tyrant, made up his mind to break down the ungovernable "monster" by severity, contempt, and punishment. Encouraged to this by a Swiss woman, Mme. de Pailly, who had usurped in his household the place of the absent lawful wife, he was for many years the persecutor of his own son, who must have been gifted with much natural goodness and magnanimity to go through such trials without becoming a confirmed reprobate. After having him educated at home by private tutors, who, in his eyes, were entirely too indulgent for such a "dishevelled bully," the marquis placed him at a military school in Paris, depriving him of his rightful name, and contemptuously calling him "M. Pierre Buffière." On July 19, 1767, he entered him as a volunteer in the Berry regiment of cavalry, under a colonel notorious for his severity; but "Pierre Buffière" behaved so well as to give full satisfaction to his superiors. Being left penniless through his father's meanness, he contracted a few debts, lost 40 louis at the gaming table, and surpassed his colonel in the affections of a young girl at Saintes. These offences brought upon him the wrath of his father; and he was lodged for several months in the fortress on the isle of Ré. Here he made a friend of his gaoler, who reported favorably concerning him. In consequence of this, his father, instead of sending him to die by fever in Surinam, as he at first intended, procured for him a commission as 2d lieutenant in the regiment of Lorraine, which was sent to Corsica in 1769. During a year of hard service, he evinced such alacrity, courage, and fidelity, as to command the esteem of his officers and the affections of his comrades. On his return he was sent to his uncle, the bailli of Mirabeau, in Provence, and soon, by his frankness, cordiality, and cheerfulness, concil-

iated the old man, who undertook to bring the father to a better feeling toward the discarded son. The latter on his part spared no effort to placate his sire, working "like a galley slave" to improve the ancestral estate of Mirabeau and better the condition of the neighboring peasants. He was at last allowed to assume his right title, and moreover to visit Paris in the spring of 1771. He was now presented at the court, and for a while brilliantly kept his rank among the young nobles. The time arrived for him to marry; by his father's advice, he paid his addresses to an heiress in Provence, Marie Emilie de Oovet, the only daughter of the marquis of Marignane, and, in spite of rivals and obstacles, conquered the young lady, who, on June 22, 1772, became his wife. This was the starting point of new and greater misfortunes. On account of the inadequate income that had been assigned to him, Mirabeau, who had a taste for magnificent living, soon became involved in pecuniary difficulties. His father not only declined to help him, but prevented the marquis of Marignane from lending him the means of relief. He moreover got a *lettre de cachet* against the "spendthrift," who was ordered to retire to Manosque, and who here, while his wife bore him a son, wrote an essay upon despotism. But Mirabeau, having dared to absent himself for a few hours from that village, in order to rescue a friend from a matrimonial difficulty and avenge an insult that had been offered to his younger sister, was, by his father's order, Aug. 28, 1774, caged in the gloomy castle of If at Marseilles; and when his wife and family prayed for his release, the iron-willed marquis had the prisoner removed, May 25, 1775, to the fort of Joux, in the Jura mountains. Being allowed occasionally to visit the neighboring town of Pontarlier, he fell in love with Sophie, marchioness de Monnier, the young and gifted wife of an old magistrate, whom 4 years before she had reluctantly wedded. His love was reciprocated; but, conscious of the dangers of this attachment, Mirabeau tried to avoid them by calling his wife to him, as a safeguard against his own passion; the countess sneeringly declined the summons, and the two lovers were left to themselves. Both were subjected to persecution, he from the commander of the fort of Joux, she from a jealous husband. He finally fled alone, and wandered for many weeks in Switzerland and the S. E. part of France, yielding occasionally to the attraction that brought him back to the vicinity of the town where his mistress was suffering every kind of severity. "Gabriel or death!" she cried; and on the night of Aug. 28, 1776, dressed in man's attire, she escaped from her husband's home, scaling the garden wall by a ladder, and flew to Verrières, Switzerland, where her lover had just arrived. A few weeks later they were in Amsterdam, where Mirabeau, under the fictitious name of St. Mathieu, tried to make a living by writing for Dutch publishers. He succeeded, made some translations

from the English, and wrote his *Actes aux Hessois*, an eloquent pamphlet against the Hessian sale of soldiers to England for putting down the American revolution. Amid this busy life, May 14, 1777, both himself and his companion were arrested by a French police officer, sent by his father and her husband. Four days before he had been sentenced by the tribunal of Pontarlier to be beheaded for "forcible abduction and seduction," while she was condemned to imprisonment for life. For the present they were carried off to Paris, Sophie to a private penitentiary, which she was soon to exchange for a convent at Gien, and Mirabeau to the dungeon of Vincennes, where 42 months of close confinement awaited him. His father had resolved upon keeping him a prisoner for life, but eventually changed his mind. This was a period of frightful bodily and mental trials for Mirabeau; once he was about giving himself up to despair, and by the middle of 1778 he had made every preparation to take his own life. But hope and courage returned; and he went on, incessantly engaged in writing love letters to the unhappy Sophie (a favor which had been kindly granted to him by the chief of police, Lenoir, as the only means of preventing his suicide), deprecatory letters to his father, uncle, sister, and friends, and above all literary works through which he was able to earn some money to relieve his own and Sophie's wants. In fact he was little more than a pauper, his father not even allowing him enough to procure decent clothing. His incarceration, interrupted by a single hour a day for walk and exercise, brought on gravel, stone, bloodspitting, and, what was still more cruel to a man whose only consolation was found in his books and correspondence, failing eyesight. He withstood all, and battled manfully against misery. Among the works which he wrote during his stay at Vincennes, the most important was his *Lettres de cachet et prisons d'état*, remarkable alike for eloquence and learning. His entreaties to his father, which passed almost unnoticed, would have been useless, if the latter, moved by the death of his grandson, Victor, had not thought of the necessity of "perpetuating the family," which made him "swerve from the word he had given to keep the father in prison." It was however 26 months only after the death of the child, Dec. 13, 1780, that Mirabeau saw the door of his dungeon open. His first work on regaining his liberty was an attempt to settle the warfare that had been going on between his parents for many years; but here he failed. His mother was for ever alienated from him; but the success which she obtained in her lawsuit against her husband, was followed at once by the reconciliation between father and son, May 20, 1781. For several months the latter had devoted himself to winning his father's affections, and in this he was partly successful. During this period he had an interview with Sophie. Jealousy and suspicion had previously existed between them; now came reproaches and recrimina-

tions. "The anger on both sides passed all reasonable bounds;" and so the lovers parted for ever. He however did not separate his cause from hers when, in 1782, he went to Pontarlier in order to have the sentence of May 10, 1777, reversed. He had already effected much toward this desired end, when a compromise, effected by his brother-in-law, Count du Saillant, put an end to a difficult litigation. While Mirabeau had, as he said himself, "his head replaced upon his shoulders," Sophie was separated from her husband, receiving back her dowry and an annuity of 1,200 livres beside. Mirabeau has been charged with having, by his dereliction, caused her death; this is entirely erroneous. Sophie, who seems to have forgotten Mirabeau previous even to his liberation, had, after the death of her husband, recovered her entire freedom, and engaged to marry a gentleman of the name of Poterat. He having died of consumption, she put an end to her own life, Sept. 9, 1789. Another and still more difficult task was now before him—a reconciliation with his wife. For nearly 8 years she had been separated from him; and although she had no hatred against him, she was wholly under her father's control, who entertained the most decided hostility to his son-in-law. Mirabeau went to Provence, and on his arrival wrote the most humble and touching letters; but they were at first answered coldly, then with insults, and finally sent back unopened. He then resorted to law proceedings, which he conducted himself with marked ability and a moderation which was scarcely in accordance with his known temper. Here it was that he, for the first time, evinced the powerful eloquence that was to shine so brilliantly in the constituent assembly. His pleadings before the parliament of Aix created deep emotion among the people of that city, the majority of whom sided with him; but one half of the judges were relatives of Maignane, and the court decreed, July 5, 1788, that the wife should remain separated from her husband. Mirabeau was defeated, but he had made himself so popular that he was "the idol of the whole country." He was determined to appeal, but was baffled by the difficulties he met in his own family and at the hands of the keeper of the seals. Having published in Belgium a new case in which the latter was unsparingly handled, he thought it prudent to absent himself from France, and went to England, where he saw the best society and published his *Considérations sur l'ordre de Cincinnatus*, and his *Doutes sur la navigation de l'Escaut*, a defence of the Dutch monopoly against the designs of the emperor Joseph II. He returned to Paris in April, 1785, and wrote several able pamphlets on financial matters. At the close of this year he visited Berlin, where Frederic the Great twice gave him a private audience. Here he published a pamphlet upon Cagliostro and Lavater, and an "Essay on Moses Mendelssohn

and the Jews." After paying a short visit to Paris, he returned with a secret mission from the French ministry. For 6 months he held a semi-official correspondence, and accumulated materials for a great work upon the Prussian monarchy. In 1787 he returned to France, and tried in vain to be appointed clerk of the assembly of notables; wrote a pamphlet, *Dénonciation de l'agiotage*, in which he commenced his assaults upon Necker's financial policy; and, being threatened with another *lettre de cachet*, went to Brunswick, where he completed his work, *De la monarchie Prussienne*, which was published the next year (8 vols. 8vo. and 4 vols. 4to.). With the exception of the few months of his mission to Prussia, he had recently been greatly embarrassed by pecuniary difficulties; but now he found himself in the most wretched situation; and it was probably under the pressure of sheer penury that he published, under the title of *Histoire secrète du cabinet de Berlin*, his confidential letters to the French ministry. This publication was ordered to be burned by the hands of the executioner. The convocation of the states-general being now announced, a new field opened to the feverish activity of Mirabeau. He went to Provence in the beginning of 1789, and presented himself for election to the nobility of this province; but he soon drew upon himself their implacable hostility by his boldness in the discussions as to the mode of election. He was finally expelled from their assembly, as having no fief of his own, and threw himself into the arms of the third estate. Here he was enthusiastically welcomed; his reception at Marseilles and at Aix was triumphant, and his influence was so powerful over the popular classes, that he was called by the authorities to quell serious disturbances which had broken out in those cities. His exhortations were respectfully heeded by all; and for a while he was literally the sovereign of Provence. He was elected in both the cities he had protected against disorder and pillage, and finally decided to sit for Aix. He now returned to Paris. On his appearance at Versailles, on May 4, 1789, in the procession among the deputies of the third estate, he was eagerly observed by all, being hissed by some and applauded by the majority of the crowd. In the assembly, where strong prejudices against him had been created by the recklessness and follies of his past life, he had to struggle hard to gain an influential position, and indeed he never succeeded in it entirely; he never had any party there; nevertheless, through his genius, his commanding superiority in reasoning, that blending of logic and impetuosity which was so characteristic of his eloquence, he swayed it at will on almost every important occasion. He was the mouthpiece of the revolution, and hence his power. He encouraged the third estate to maintain their rights against the pretensions of the other orders. At the end of the royal sitting of June 28, he sent the grand

master of ceremonies back to the king with this bold answer: "Go and tell your master we sit here by the will of the people, and that we are only to be driven out by the bayonet." But he was not hostile to the royal power; from the beginning he was ready to uphold any plan that, while strengthening royalty, would have secured liberty to the people. He did not favor mobs and riots, being anxious to achieve reforms through the instrumentality of the lawfully constituted assembly; and when he saw that the revolutionary tide was carrying the monarchy toward the abyss, he was willing to ally himself with the king in order to prevent that consummation. He had already advocated with unflinching energy the royal prerogative in the veto question. He now consented to act more directly in behalf of a policy which was the only safe one; and, while "utterly opposed to a counter-revolution," he declared himself ready to make an effort for "the restoration of the king's legitimate authority as the only means of saving France." In consequence of this determination, part of his debts, about 80,000 francs, were paid by order of the king, and he received a monthly pension of 6,000 francs to help him in the furtherance of his designs. He also received 4 notes of 250,000 francs each; but these were given back to the king on the great orator's death. This has been seized upon by his enemies as evidence of his venality. It must, however, be observed that, although paid by the king, he was but following up his own system; he certainly would not have sold his own convictions; he never did this even during the worst hardships of his precarious life. While these arrangements were going on, Mirabeau engaged in one of his most celebrated oratorical contests. On May 20, in an elaborate oration, he supported the king's right to declare peace or war. On this he struggled alone against several celebrated orators, and especially against Barnave, whose popularity was now more than equal to his own. While Barnave was borne in triumph, the very tree was marked upon which Mirabeau was to be hanged; hawkers went about selling a pamphlet in which he was charged with treason and corruption. Unterrified he faced the storm; on May 28 he proceeded to the hall amid the threatening clamors of an angry crowd, ascended the tribune, and, alluding to what was going on, said: "A few days ago, I also was to be carried in triumph, and now they are bawling through the streets: 'The great treason of the count of Mirabeau.' This lesson was not necessary to remind me that the distance is short between the capitol and the Tarpeian rock; but the man who fights for common sense and his country is not so easily conquered." He went on in a strain of fervid and convincing eloquence, and came out triumphant. He took part in nearly all the succeeding debates, sparing no exertions to insure the success of the cause he advocated. Repeated efforts that would have exhausted the energies of any other man

seemed but to give new impetus to his activity. "A day to him," says an eyewitness, "was more than a week or a month to others. The mass of business he carried on simultaneously was prodigious; from the conception to the execution not a moment was lost." To his absorbing duties as a deputy were added those of a journalist; from the opening of the states-general he had been publishing a journal, which, first under the title of *Journal des états généraux*, then *Lettres à mes constituants*, and finally *Courrier de Provence*, gave a report of the sittings, and freely discussed all the questions of the day. To meet the exigencies of his twofold task, beside occasional assistance he received from friends or outsiders, he had called around him coadjutors, such as Dumont, Duroveray, Reibaz, and others, who not only wrote for his periodical, but assisted him in the preparation of such documents as were needed, and even in his speeches. These men were of great service to him, and the two former especially may claim a large share in the composition of some of his best orations, though in fact they only furnished materials in compliance with his directions; his genius infused life into their productions; between a speech as written by Dumont or Duroveray, and as delivered by the commanding orator, there was as much difference as between a dead body and a living being, full of fire and enthusiasm. Mirabeau's speeches, whatever the pen that sketched or worded them, are incontrovertibly his own, as he not only suggested them, but vested them with a life and splendor which came from himself alone. It was during his later months that he uttered some of his most powerful appeals to the assembly, and, in spite of all assaults and slanders, exercised in it a controlling power. But his strength became exhausted amid his Herculean labors, rendered still more dangerous by high living and licentiousness. Nothing could persuade him to repose. On March 27, 1791, though frightfully ill, he occupied his seat in the assembly and spoke no fewer than 5 times; but this was the finishing blow to his undermined constitution. He went home nearly dead; and his friend and physician Cabanis saw at once that the end was approaching. The news of his dangerous illness spread over Paris like a public calamity; the Chaussée d'Antin, the street in which he lived, was thronged by the multitude who anxiously inquired after his condition; bulletins were printed and distributed every hour; twice a day the king sent a messenger to his house for tidings. On the eve of his death, he heard the sound of distant guns. "Have we already," he said, "the funeral of Achilles?" After a night of terrific suffering, at the dawn of day he addressed his physician Cabanis: "My friend, I shall die to-day. When one has come to such a juncture, there remains only one thing to be done; that is, to be perfumed, crowned with flowers, and surrounded with music, in order to enter sweetly into that slumber from which there is no awak-

ing." He ordered his bed to be brought near the window, and looked with rapture at the brightness of the sun and the freshness of his garden. For three quarters of an hour he freely conversed with La Marck and Cabanis. "I carry away with me," he said, "the mourning for the monarchy; its shreds will now be the spoil of the factions." Toward night he suffered dreadfully, and insisted that his physician should give him opium to relieve him from his tortures. Cabanis refused; but in order to pacify his anger, he pretended to consent, giving him a few drops of a harmless mixture. A few minutes later he breathed his last. He had not yet completed his 42d year. His loss was mourned by the whole nation; every one felt that the ruling spirit of the revolution had passed away. His body was carried in pomp by the assembly and the people to the church of St. Geneviève, which was henceforth to be called the Pantheon of France, with this inscription on its front: *Aux grands hommes la patrie reconnaissante*. Three years later, by order of the convention, Mirabeau's remains were taken to the churchyard of St. Catharine, the resting place of criminals, while those of Marat took possession of the Pantheon.—The *Œuvres de Mirabeau* have been published by Barthe (8 vols. 8vo., Paris, 1819), and by Mérimée (9 vols. 8vo., 1825-'7); but neither of these collections is complete, while the biographical notices by which they are accompanied are far from correct. Many of his productions have had but one edition, and are now difficult to find. The large biography by Peuchet (4 vols. 8vo., Paris) is nearly worthless. The *Mémoires biographiques, littéraires et politiques de Mirabeau*, by Lucas-Montigny, his adopted son (9 vols. 8vo., Paris, 1834-'5), are as yet, in spite of serious defects, the most valuable source of information on the subject. To this must be added *Correspondance entre le comte de Mirabeau et le comte de La Marck pendant les années 1789-'90-'91* (3 vols. 8vo., Paris, 1841), and Dumont's posthumous *Souvenirs* (1831).

MIRACLE (Lat. *miraculum*, from *miror*, to wonder), in the stricter usage of the word, a work of divine power, interrupting (or violating) the ordinary course of nature, and directly designed to attest the divine commission of him who works the miracle. It is not in violation of the law of cause and effect, for it has an omnipotent cause; it is not logically disproved by the uniformity of nature, for that uniformity is restricted, *ex hypothesi*, to a different sphere; it is not a mere isolated event, but has a providential or religious design; and that design is not directly to prove the truth of the message, but rather to enforce the credibility of the messenger. The very idea of a miracle, in the sense of the Christian evidences, supposes a contrast between the natural and the supernatural; for a miracle has a supernatural origin; yet, appearing in the forms of space and time, it is subject to the scrutiny of the senses, and an object of human testimony. In the infancy of

physical investigation, and under the influence of instinctive religious belief, portents and prodigies have been quite uniformly ascribed to a supernatural source. Miraculous power has been attributed to the priests of superstitious rites, as well as to the founders of new forms of faith. In the Scriptures of the Old and New Testament, both the *sepos*, or *prodigium*, and the *σημειον*, or sign of divine power, are included in the general idea of miracle, but not dissociated. Christ says: "The works that I do bear witness of me, that the Father hath sent me." The apostles enforced their claims by signs and wonders and mighty works. The earlier opponents of Christianity, unlike the later, did not contest the fact of miracles, but, on the contrary, equally appealed to the prodigies of heathenism. The conflicting testimony as to the continuance of miracles in the early church is to be explained in part by the different senses in which the word is used. The two most careful recent English writers on these ecclesiastical miracles come to entirely different results; Dr. Blunt maintaining that miracles never ceased; and Bishop Kaye, that the power cannot be traced beyond the disciples upon whom the apostles laid their hands. Augustine, *De Doctrina Christiana*, c. 25, says: "Since the establishment of the church, God does not wish to perpetuate miracles even to our day, lest the mind should put its trust in visible signs, or grow cold at the sight of common marvels;" but in his *Retractationes* he remarks: "This I said, not because none are wrought now." Eusebius related that Natalius, a Theodotian, was beaten through the night by angels, and renounced his heresy. Stricter notions and definitions were introduced in the progress of theological scrutiny. Chrysostom says that "a miracle is a demonstration of the divine dignity," and that "no vestige of the power remains." Augustine, *De Civitate Dei*, 21, 8, argues that a miracle is not against nature in its highest aspect: "How is that against nature which comes from the will of God, since the will of such a great Creator is what makes the nature of every thing? In miracles God does nothing against nature; what is unaccustomed may appear to us to be against nature, but not so to God, who constituted nature." Abelard maintained that, in relation to the divine omnipotence, naught is miraculous. Aquinas sharpens the contrast between the miraculous and the natural: "Miracles are all things done by divine power, beside the order commonly preserved in the course of affairs." The schoolmen set up two criteria of miracles, that they are: 1, contrary to nature; 2, by the power of God. After the reformation, in connection with the progress of modern philosophy, both physical and metaphysical, the necessity of yet further distinctions and limitations became manifest. Lord Bacon in his "Advancement of Learning" asserts: "There never was a miracle wrought by God to convert an atheist, because the light of nature might have led him to confess a God;

but miracles are designed to convert idolaters and the superstitious, who have acknowledged a deity but erred in his adoration; because no light of nature extends to declare the will and worship of God." Hobbes arbitrarily restricted the benefit of miracles to the elect: "A miracle is a work of God (beside his operation in the way of nature), ordained in the creation, for the making manifest to his elect the mission of an extraordinary minister for their salvation." Spinoza in his *Tractatus Theologico-politicus* led the way in the historical criticism of the biblical narratives, on the basis of the definition: "A miracle signifies any work, the natural cause of which we cannot explain after the example of any thing else to which we are accustomed; or, at least, he who writes about or relates the miracle cannot explain it." The German rationalism, in its earlier form, attempted the explanation of the gospel miracles by material and spiritual causes. Some alleged that Jesus had unusual knowledge of the powers of nature, or effected his cures by his spiritual influence over men's souls. Others, as Paulus, explained them by the supposition, that the disciples confounded natural events with supernatural; *e. g.*, the two angels in the tomb, clad in white, were an illusion caused by linen garments hanging there; or by such violent interpretations as that the walking upon the sea meant walking on the border of the sea. Some, again, found in them only a symbolical or allegorical sense, and interpreted them as images of spiritual truths. In the mythical theory of Strauss, they are denied as facts, and explained, not as wilful deceptions, but as a spontaneous expression of popular religious feeling, ascribing to Christ what is false in fact, but true in some very general philosophical idea. His criticism of the Gospels proceeds on the assumption, that nothing can have historical reality which is either miraculous or prophetic. With such a canon of criticism, it was not difficult to eliminate from the evangelical records all events of a supernatural character. In meeting such objections, and others to be noticed below, various definitions have been given to miracles, and different positions assigned them in the sphere of the Christian evidences. They have been defined from their cause, as a work of direct divine energy; from their characteristics as compared with natural events, as superseding or violating the ordinary laws of nature; from their immediate effects, as producing wonder and an impression of the divine presence; and from their final cause, as designed, according to some, to evoke faith, and according to others, to accredit the miracle-worker. Many defenders of Christianity yielded to the objections so far as to define all miracles as relative to human knowledge, or to the effect to be produced upon man's soul. As to the position of miracles in the evidences, some divines, in the reaction against rationalism, have laid the chief stress upon these external signs of divine power, making the miracle to be the chief source of an indubitable

belief, while others have put the truth of the doctrine in the front rank, and made the doctrine the test of the miracle, rather than the miracle the proof of the doctrine. Thus in the more recent English discussions, Dr. Wardlaw would test the doctrine by the miracle, while Dean Trench advocates the converse order. But it seems difficult, and even illogical, to construct on this point an absolute dilemma; for, on the one hand, the mind can and does receive spiritual and divine truth on its own evidence, and for its own sake; while, on the other hand, all who are enlisted in this debate allow that miracles have an important position in the external evidences for the Christian faith. Their value must then be found in their relation to the commission of the worker of the miracles, as a chosen agent for communicating divine truth. To the question, how the miracle proves the credibility of the worker, Dr. Wardlaw replies, that it is an example of the supernatural, and thus the same in kind with what it is intended to confirm; it involves prophecy as to an event, and "prophecy is a miracle of knowledge, while the miracle is a prophecy of power."—Objections to miracles, urged by individual thinkers in all ages, have assumed a more formidable aspect in modern times, in connection with historical criticism on the one hand, and the progress of the physical sciences, disclosing the uniformity of nature, on the other. As far as exegetical and historical criticism is concerned, these objections can be met only by detailed investigation. The more general objections have respect either to the abstract possibility of miracles; or to the violation of the laws of nature supposed to be involved; or, again, to the possibility of their proof, allowing them to be possible in the abstract. As far as the abstract possibility of miraculous intervention is concerned, the whole question belongs, not to the specific sphere of the Christian evidences, but to the more general province of natural theology. An atheist, a pantheist, a fatalist, may concede the inexplicable, but he cannot grant the miraculous; for, considered as a work of divine power, it is to him an effect without a cause. It is on the basis of the pantheistic theory that Strauss, for example, asserts the *a priori* impossibility of miracles, when he says: "The absolute cause never disturbs the chain of second causes by single, arbitrary acts of interposition, but rather manifests itself in the production of the aggregate of final causalities and of their reciprocal action." But, if the absolute cause be a wise intelligence, the miracle is, of course, not "a single, arbitrary act," but a part of God's whole providence. The uniformity of nature has been frequently adduced, as if it were an axiomatic truth, in opposition to the evidence for miracles. This is strongly urged in recent times by Prof. Baden Powell, in his last work on "The Order of Nature." But the uniformity of nature, as far as any given external facts are concerned, is not an absolute truth, is not an intuitive perception; it is simply a matter of

induction. The formula presupposed in the induction is an absolute truth; that formula is simply this: that the same causes, in the same circumstances, produce the same effects. But that formula is not violated in the case of any alleged miracle, for the effect is ascribed to a different, that is, to a divine cause. Thus Brown, in the notes to his essay on "Cause and Effect," truly says that a miracle is a new effect, supposed to be produced by a new cause; and John Stuart Mill, in his "System of Logic," concedes that in the "alleged miracles the law of causation is not contradicted." To meet the same objection, it has often been maintained, that, at any rate, only the order of the lower, physical nature is interrupted; that a higher law sets aside or uses the lower laws; that the material and phenomenal is turned into the service of the ethical and spiritual. Using incidentally such *a priori* objections, the most acute sceptic of modern times made his argument against miracles turn rather upon the possibility of their proof, than upon their mere abstract possibility. David Hume in his "Essays," while admitting the abstract possibility of miraculous intervention, takes the ground that testimony, through which alone we can know a miracle, is often fallacious, while constant experience is in favor of that uniformity of nature which the miracle subverts. His objection was not fully met by the counter position, that we instinctively credit human testimony. But when he claims that all experience is against miracles, he either begs the question, or, if he allows the possibility of exception in the cases in dispute, he logically breaks the spell of his assumed uniformity of nature. It has also been urged that, in the mode in which Hume makes use of his positions, it would be impossible to prove many facts which are generally admitted; for example, the introduction of any new series or orders of beings in the created universe; since there has been no experience reaching to such facts. At any rate, if the *a priori* objections to the possibility of a miracle are abandoned, and the whole question is made to turn upon the credibility of Christ and the apostles, the argument is transferred to a sphere in which the advocates of miracles have always been willing to meet their opponents. For, while the uniformity of nature may raise an antecedent presumption against a miracle, that presumption, it is claimed, is dissipated when we consider the need and the object of this supernatural interposition—that is, to redeem a fallen world; and thus miracles, as Paley argues, have the same degree of probability with a revelation. And especially is it held to be consonant with the character and claims of Christ, that he should manifest such unrivalled power over the natural world—a power he always used for beneficent ends.—For a full discussion of miracles, the reader may consult Campbell, "Dissertation on Miracles;" Douglas, "Criterion, or Miracles Examined;" Leland, "View of Deistical Writers;" Farmer, "Dissertation on

the Miracles;" Leslie, "Truth of Christianity;" Wardlaw, "On Miracles;" Alexander, "Christ and Christianity;" N. W. Taylor, "Lectures on Moral Government;" Thornwell, "Southern Presbyterian Review," 1857; Strauss, *Das Leben Jesu*; Schleiermacher, *Der Christliche Glaube*; Julius Müller, *De Miraculorum J. C. Natura et Necessitate*; Tholuck, *Glaubenswürdigkeit der evangelischen Geschichte*, and on the miracles of Mohammed and those in the Catholic church, in his *Vermischte Schriften*; J. P. Lange, *Christliche Dogmatik*. On the continuance of miracles in the church, beside the works of Blunt and Bishop Kaye, see Middleton, "Miraculous Powers;" J. H. Newman (in reply to Taylor's "Ancient Christianity"), "Essay on Miracles," prefixed to his translation of Fleury's *Histoire ecclésiastique*; H. Bushnell, "Nature and the Supernatural."

MIRACLES AND MORALITIES, religious and allegorical plays, which constituted the drama of the middle ages. They were at their origin often called miracle plays and moral plays, and in later times have more frequently been indiscriminately styled mysteries. The subjects of the miracles were either the narratives of the Old and New Testaments or the legends chiefly of the lives of the saints; and the moralities, which appear later, intermingled allegory with sacred history, or were represented exclusively by allegorical personages. In the first ages of Christianity, baptism was refused to any one concerned with the theatre. Both the Greek and Latin fathers anathematized the dramatic art, and Chrysostom declared it a shame that people should listen to a comedian with the same ears that hear a preacher. The church succeeded in the 4th century in extinguishing the theatre everywhere except in Constantinople, where the genius and the arts of antiquity lingered in decay. This triumph had hardly been accomplished when from the bosom of the church sprang a new drama and spectacle. The sacred ceremonies and commemorations of the Christian faith, in the name of which profane games had been proscribed, were themselves transformed into dramatic representations. Gregory of Nazianzus, patriarch of Constantinople, composed a play on Christ's passion, and others of the same kind, to supersede those of Sophocles and Euripides, which had till then maintained themselves on the stage. The progress of this fantastic Christian drama cannot be traced till about the 11th century, when Theophylact of Constantinople introduced the feast of fools, the feast of asses, and other religious pastimes, which were celebrated in churches. To these sports the clergy added the acting of miracle plays, which originally were not only composed by ecclesiastics, but were performed by them in churches and the chapels of monasteries. They were afterward exhibited by trading companies, each guild sharing the expense, and undertaking a portion of the performance; and they served the purpose of amusing the peo-

ple on public occasions and festivals, while the clergy were at length forbidden by popes and councils to take any part in them. Jugglers and minstrels attended the ambulating companies, and exerted all their skill on these occasions. The stages, either temporary or portable on wheels, usually consisted of 8 platforms, raised one above another. On the uppermost sat the *Pater Cælestis*, surrounded by his angels; on the second appeared the saints and glorified men; while living men occupied the lowest. On one side of the stage appeared a dark, pitchy, flaming cavern, from which issued hideous howlings, as of souls tormented by demons; its occupants were the greatest jesters and buffoons of the company, and constantly ascended upon the stage to act the comic parts. It is probable that miracles were introduced, perhaps by returning pilgrims, from Constantinople into Italy, and thence into France and England. The oldest that are known are in Latin, but in the 12th and 13th centuries they became common in the modern languages; and with some exceptions there is a general resemblance in subjects, characters, and theatrical machinery between those of different countries. It is probable that they had a common origin, and were introduced about the same date, being communicated from one religious body to another. The sacred Latin comedies of Roswitha, a German abbess of the 10th century, were perhaps performed in her own convent. There are extant 8 Latin miracles written early in the 12th century by Hilarius, a disciple of Abelard, the subjects of which are the raising of Lazarus, the life of St. Nicholas, and the history of Daniel. It is certain that the miracle of St. Catharine, by Geoffrey, abbot of St. Albans, was performed both in Dunstable, England, and in Paris about the same time, and that it was then no novelty. Other Latin plays are preserved which seem to have been very popular, both as scholastic exercises among the younger monks, and as popular exhibitions, the greater part of the story being told by pantomime. The mystery of the wise and foolish virgins, in which are used alternately Latin and Provençal, indicates the period of transition to the vernacular languages, and may stand at the head of European dramatic literature.—The miracle of the passion was one of the earliest and most wide-spread, and from it the first theatrical company of Paris, established in 1402, was called the brethren of the passion. It embraced the principal events in the life of Christ, and was so long that its representation occupied several days; 87 personages appeared in it, among whom were the 3 members of the Trinity, 6 angels or archangels, 12 apostles, 6 devils, Herod with all his court, and divers fictitious characters. It appears to modern readers rather grotesque than grand, yet it was exhibited with splendid pomp, and served to impress upon the minds of spectators the events and doctrines that were deemed of greatest importance. The Virgin Mary is a favorite character

in French mysteries, and several of them bear the title of *miracles de Notre Dame*. Others are entitled mysteries of the conception, of the nativity, of the resurrection, and of divers events in the legends of the saints and in the narratives of the Old and New Testaments. The splendor of the theatrical decorations and appliances for inspiring terror increased during the 15th century. In one of the Parisian mysteries St. Barbara was hung up by the heels on the stage, and after uttering her remonstrances was torn with pincers and scorched with lamps before the audience. In a mystery exhibited at Mentz in 1487, an immense dragon sprang out of hell, and threw the spectators into consternation by spreading his wings close by them. The mystery of the "Act of the Apostles" was acted for many successive days in 1541 before the nobility, clergy, and a large popular assemblage in Paris. The *dramatis persona* are God the Father, Son, and Holy Ghost, the Virgin and Joseph, archangels, angels, the apostles and disciples, Jewish priests, emperors, philosophers, magicians, Lucifer, Satan, Beelzebub, Belial the attorney-general of hell, Cerberus the porter, and a multitude of other celestial, terrestrial, and infernal personages, amounting altogether to 485 characters. A large number of French miracles exist in manuscript, and many have been printed or reprinted during the present century.—The Germans have numerous miracle plays, two of which are peculiar to their own literature, not being traced in the contemporary productions of other European nations. The subject of the first of these is Dr. Faustus, which represents the life, death, and damnation of a daring libertine. The subject of the second is the canonization of Pope Joan, which was written in 1480 and attained general popularity. It has 25 characters, among which are the devil and his mother Lilia, 3 good angels, the Virgin Mary, her Son, Pope Basil, 4 cardinals, a Roman senator, and Death. The scene shifts between earth, hell, purgatory, and heaven. It begins with a council of devils, who agree to tempt Jutta, the heroine, to profane the papacy. She assumes boy's clothes, accompanies a young clerk to the university of Paris, acquires a doctor's degree, proceeds to Rome, and is made successively cardinal and pope. The Virgin Mary sends an angel to ask Jutta whether she prefers perdition or penance and final pardon. She resolves to repent, but Death suddenly seizes upon her soul while she is lying-in, and carries it to the devils in hell. The Virgin again intercedes, and sends an angel from the throne of grace to release her from torment. The play terminates with the magnificent spectacle of her ascension into heaven. This bold drama had so much effect in Germany, that when the Protestants employed the fiction of a female pope to bring the papacy into contempt, much literary industry was required to eradicate the delusion. Germany was celebrated for its *Fasnachts Spiele*, or carnival plays, in which religious subjects were treated with un-

bounded license. In one of them, which is extant, Virgil accompanies the shepherds to adore the new-born Christ.—The records of English miracle plays are at least as ancient as those of France or Germany. Their early popularity is attested by Langland and Chaucer, and subsequently immense crowds assembled with the greatest enthusiasm to witness their performance. They may be traced from the beginning of the 12th century, but whether they were originally in Latin or in Norman French is not certain. Higden was obliged to visit Rome 3 times before he could obtain leave to have them in the English tongue. The Chester, Coventry, and Towneley mysteries form 3 great series. As early as 1268 religious dramas were exhibited by the incorporated trades in Chester, where they continued with some interruptions until 1577. They consist of 24 dramas, which were annually represented from Whit Monday until the following Wednesday. Among the subjects are the fall of Lucifer, performed by the tanners; the creation, by the drapers; the deluge, by the dyers; Abraham, Melchisedek, and Lot, by the barbers and wax chandlers; Moses, Balak, and Balaam, by the hatters and linen drapers; the killing of the innocents, by the goldsmiths; the descent into hell, by the cooks; the ascension, by the tailors; Antichrist, by the dyers; and the day of judgment, by the websters. The series thus covered the whole period from before creation until the consummation of all things. The sacred dramas of Coventry drew immense multitudes to that city, as well from its central position as from the patronage of royalty. They were performed by the trading companies of Coventry on Corpus Christi day, from 1416 to 1591. The subjects are nearly identical with those of the two other series, but are more numerous, the plays being 43 in number. It is remarkable that the friars encouraged them as a means of stigmatizing the labors of Wycliffe, branding his Testament as a false one, anathematizing scriptural inquiry as heresy, and enlivening the attachment of the people to the "good old customs" of the church. The Towneley mysteries, so named from the family having possession of the manuscript, belonged according to tradition to the abbey of Widkirk, and are supposed to be the plays written and performed by the Augustinian friars of Woodkirk. Fairs were annually held there on the feast of the Assumption and on the feast of the Nativity of the Blessed Mary, and internal evidence indicates that these were the occasions of their exhibition. The series consists of 32 plays, bearing a near resemblance to those of the Chester and Coventry collections. The artificers and tradesmen of York also annually celebrated a Corpus Christi play, and the same day was similarly observed by the incorporated trades at Newcastle-upon-Tyne and several other large towns, and by the pariah clerks and gray friars of London. Christmas also was in this way observed in connection with the festivities

of the abbot of misrule. At York every trade was obliged to furnish out a pageant to adorn the occasion, and these pageants were 54 in number in 1415. The first part of the miracle of that year, in which God the Father appears creating the heavens, the angels, archangels, Lucifer, and the angels that fell with him, was performed by the tanners. The second part, in which God the Father created the earth and all which is therein in the space of 5 days, was represented by the plasterers. The third part, in which God the Father creates Adam and Eve and breathes into them the spirit of life, was played by the card-makers. The 54th part, which includes Jesus, Mary, 12 apostles, 4 angels with trumpets, 4 angels with lances and scourges, 4 good and 4 bad spirits, and 6 devils, was performed by the mercers. There are 8 miracle plays in the Digby MSS. in the Bodleian library relating to the conversion of St. Paul. Only a single example of the Newcastle mysteries remains, entitled "Noah's Ark, or the Shipwrights' Ancient Play," in which God, an angel, Noah and his wife, and the devil are the characters. According to Malone, the last mystery performed in England was that of Christ's passion in the reign of James I., but they had generally ceased to be written from the time of John Bale (1538). The principal English miracle plays have been published, and no other portion of mediæval literature is so strikingly marked by mingled drollery and solemnity. From the reign of Henry VI. they had been encroached upon and superseded by moral plays or moralities, in which abstract allegorical personages took the place of Scripture characters. The change was gradual. In one of the Coventry miracles the representatives of *Veritas, Justitia, Pax*, and *Misericordia* appear in the parliament of heaven. Death and the mother of Death were successively added; and as these characters increased, biblical history fell into the background and was at length eliminated. Moralities reached their highest perfection in the reigns of Henry VII. and Henry VIII., though they subsequently exhibited greater complication and ingenuity. They contained two standing characters, the Devil and the Vice. The former, the leader of the Seven Deadly Sins, was made as hideous as possible, shaggy, bottle-nosed, and with a tail. He entered upon the stage crying "Ho, ho, ho!" and his part consisted largely in roaring when castigated by the Vice. The latter, though represented as "most wicked by design and never good by accident," was chiefly employed in belaboring the Devil. He was generally dressed in a fool's habit, and the character was gradually blended with that of the domestic fool. Moralities were abundant in France and England in the 15th and 16th centuries. The interludes of John Heywood mark the transition in England from them to legitimate tragedy and comedy. In Paris the devout buffoonery of the brethren of the passion gave offence and caused their suppression in 1647, and the company which pur-

chased the Hôtel de Bourgogne was enjoined to abstain from "all mysteries of the passion, or other sacred mysteries." In French the *Moralité tressingulière et tresbonne des blasphémateurs du nom de Dieu* is one of the most celebrated; and in English Skelton's "Magnificence," designed to show the vanity of worldly grandeur, and in which the characters are Felicity, Liberty, Measure, Adversity, Poverty, Despair, Mischief, Good-hope, Redress, Circumspection, Perseverance, Fancy, Folly, and Crafty-conveyance.—Mysteries are still occasionally performed at several places in Europe, the most celebrated being that of Ober-Ammergau, in the Tyrol, which is represented every tenth year. It is the production of successive priests of the parish, and embraces the entire history of Christ from his entry into Jerusalem to his appearance to Mary Magdalen after the resurrection. Every scene is preceded and prefigured by a typical tableau. This *Passions-Spiel* originated in a vow made by the inhabitants in 1633, when mysteries were not uncommon, to commemorate their deliverance from a plague by thus representing the last scenes in the life of the Saviour once every 10 years for ever.—See Onésime Le Roy, *Études sur les mystères* (Paris, 1837); Achille Jubinal, *Mystères inédits du quinzième siècle* (2 vols., Paris, 1837); Leroux de Lincy, *Recueil de farces, moralités et sermons joyeux* (4 vols., Paris, 1837); Heinrich Hoffmann, *Fundgraben für Geschichte Deutscher Sprache und Literatur* (2d vol., Breslau, 1837), containing 4 German miracles; William Hone, "Ancient Mysteries Described" (London, 1823); Thos. Sharp, "A Dissertation on the Pageants or Dramatic Mysteries anciently Performed at Coventry" (Coventry, 1825); Collier, "History of English Dramatic Poetry" (3 vols., London, 1831); "The Towneley Mysteries," published for the Surtees society (London, 1836); Wm. Marriott, "A Collection of English Miracle Plays" (Basel, 1838); Thomas Wright, "The Chester Plays" (London, 1843), and "Early Mysteries, and other Latin Poems of the 12th and 18th Centuries" (London, 1844); and Edwin Norris, "The Ancient Cornish Drama" (Oxford, 1859). A large number of the French miracles and moralities have been published separately, among which are *Les blasphémateurs* (1881) and *La vendition de Joseph* (1835), both exact productions in form and type of the MSS. in the imperial library. Only 90 copies were issued, and one of each is in the Astor library, New York.

MIRAGE (Fr., from Lat. *miror*, to wonder), an optical illusion due to unequal densities and refracting powers of adjacent strata of the air, usually of those close to the surface of the land or sea, and in consequence of which 2 and sometimes 3 images of a distant object are seen; in the latter case, the middle one being inverted, as is the image of a distant shore in water, or as it would be if seen in a horizontal mirror stretching between it and the eye. Rays of light passing from a denser to a rarer medium are

bent, at the surface of division of the two, from a perpendicular to such surface, and the reverse. But as the angle in the denser medium is thus always less than that in the rarer, a ray proceeding from the denser to the rarer may strike the surface between them at an inclination so great that the corresponding angle in the rarer shall exceed the whole space, 90° , within which transmission could occur; such a ray cannot be transmitted, but will undergo total reflection, even at the surface of a perfectly transparent medium; so that to all rays coming from without a certain angle called the limiting angle, such a surface acts as a mirror; or rather it reflects absolutely the whole of such light, which no ordinary mirror does. These two principles of the refraction and total reflection of light explain all the cases of the phenomenon under consideration, which is often termed that of unusual refraction, and the chief examples of which are commonly known as looming or mirage, and the *fata Morgana*. (See *FATA MORGANA*.) The looming of ships or of distant shores on the sea or lakes, is seen when, owing to the presence of dense vapors or to a considerable difference of temperature of the water and air, the strata of the latter near the surface are of very unequal densities. Hence, it is here more frequent in the morning, or when the air is misty, as after rains, in the summer and autumn. At these seasons, the water, retaining its heat more perfectly over night than the air, may be in the morning several degrees the warmer, the stratum of air just over it will be rarer than that higher up, and looming is then very sure to be seen, but best by an eye quite close to the level of the water, imperfectly at heights greater than 6 or 8 feet, and rarely as high as 24 feet. In one form, a ship or other object near the water seems greatly elongated upward, or a second inverted image meets it from above. Sometimes the proper image of the object is elevated, while the second image appears inverted beneath it, and surrounded by a sheet of sky which is mirrored and repeated with it. This second image may be truncated below by the horizon, or entire; in the latter case, a third appearance, erect, and usually only partly emerging above the apparent horizon, is sometimes seen. The unusual images commonly have serrated or indistinct borders, and are marked by a tremulous motion—qualities more apparent, as indeed is the whole phenomenon, when viewed through a telescope. A horizontal line of separation runs between the first two sets of images, which is above the horizon; the apparent horizon is on the other hand depressed. Above and between these, a low shore with its inverted image may appear like a body of land actually suspended in the air. The nearer the objects, the less the angular interval between the line of separation and the apparent horizon. M. Bravais, who has most thoroughly investigated the subject, found that for a distance of 25 miles the angle was $7'$, for 5 miles $6'$, and that it disappeared at 300 yards; within which

distance, therefore, no appearance of mirage can occur. These appearances are explained by supposing 2 or 3 sets of rays setting out from the objects, only one set of which, in ordinary states of the air, would meet the eye, but all of which in certain cases, owing to unequal densities of near strata, and to consequent refraction and perhaps total reflection, may be brought by different paths to the eye. As all objects are seen in the direction from which the light appears to meet the organ of vision, 2 or 3 images in different places are the result. The inverted image is usually or always due to reflection. Thus, Dr. Wollaston obtained 8 images of an object seen through a square glass vessel holding successive layers of sirup, water, and spirit; the appearance occurring at either line of junction of two unlike fluids, and where by slow intermixture a gradual variation of density occurs. The same effect may be seen by holding a word in large type on the further side of the heated layer of air moving over a hot poker, or by regarding objects through the hot air or steam escaping from the boiler of a locomotive; and the familiar tremulous appearance of distant fences heated by the summer's sun, and of objects seen through air over any hot bodies, are imperfect instances of the same phenomenon. In 1823, in the arctic regions, Capt. Scoresby recognized by its inverted image in the air the ship *Fame*, which afterward proved to be at the moment 17 miles beyond the visible horizon of the observer. Dr. Vince, on Aug. 6, 1806, at 7 P. M., saw from Ramsgate, at which place usually only the tops of its towers are visible, the whole of Dover castle, appearing as if lifted up and placed bodily on the near side of the intervening hill. So perfect was the illusion, that the hill itself could not be seen through the figure. This form of mirage may be lateral, as well as vertical, arising from unequal density of two contiguous vertical bodies of air. Thus, on Lake Geneva, a boat has been seen doubled, the two images some distance apart; persons have been duplicated in the same way; and any one in a hot day, by placing his eye near to a heated vertical wall, may see lateral mirage of objects at a distance and nearly in a line with the wall. Upon land, the mirage is best seen over desert plains in hot climates; the intense heat of the sands greatly rarifies the air in contact with them, and rays of light coming from distant objects, as villages, or the trees upon oases, are gradually bent by approaching this rare stratum, until they strike it at an angle greater than the limiting angle; total reflection then occurs, the air near the sand acting as a mirror or a body of water, in which inverted images of the objects are seen. Thus is presented to the inexperienced traveller the appearance of tranquil lakes, sometimes almost surrounding him; this, however, necessarily changes to the real aspect as he approaches, as if the waters were continually receding before him.

MIRAMICHI, a port, bay, and river of New Brunswick. The bay is about 21 m. long and

20 m. wide at its mouth, Point Portage being on the N. and Escuminax point on the S. It contains Fox and Portage and a number of smaller islands. The river is formed by the junction of 2 branches about 50 m. from the sea. At its mouth, which is obstructed by a sand bar, are landing places for cargoes, but the chief business places are Newcastle and Chatham, 20 m. up the stream. It is navigable for a distance of 40 m. from its mouth. Great forests of pine cover the banks of the river and surrounding country. In 1825 a conflagration destroyed the forests on the N. bank and all the towns and villages within an extent of 85 m. long, and in some parts as much as 25 m. broad. The smoke and cinders were observed at Quebec, more than 250 m. distant, and even as far S. as the Bermudas. The pines in the burned district have been succeeded principally by poplar, white birch, and maple.

MIRAMON, MIGUEL, a Mexican soldier, born in the city of Mexico about 1830. He is the son of Gen. Miramon, and was educated at the military academy of his native city. He early entered the army and served under Alvarez, whose private secretary had been among his classmates. His conduct, however, gave umbrage to his superior, and subsequently he was made a prisoner by Gen. Comonfort, but succeeded in effecting his escape. Noted for his courage, but deficient in character and statesmanlike qualities, he became the nominal leader of the anti-liberal and clerical party, and rose to the supreme command of the revolutionary forces during the civil war of 1858-'60. After a protracted struggle his defeat was reported to have taken place, Aug. 18, 1860, after which he shut himself up in Mexico with about 7,000 men, the army of the liberal party advancing with rapid strides toward the capital, with a probability of his final discomfiture.

MIRANDA, FRANCISCO, a Spanish American patriot and French general, born in Caracas, South America, about 1750, died in prison in Cadiz, Spain, in 1816. He was expelled from South America on account of his participation in the efforts made to deliver the Spanish colonies from the yoke of the mother country, and finally entered the French service as general of division. He took a part in the campaign of 1792, and in 1798 accompanied Dumouriez to Belgium, where he commanded a division of the army at Neerwinden. He was held responsible for the loss of that battle, and was accused of being implicated in the treachery of Dumouriez, and brought before the revolutionary tribunal, but acquitted. Soon, however, he again gave umbrage to the revolutionists, and was eventually compelled to seek refuge in England. Afterward he endeavored to obtain the joint assistance of Great Britain and the United States for the liberation of the Spanish American colonies; his hopes, however, were disappointed; he returned to France in 1804, but was again expelled from the country by the first consul. In 1806 he fitted out his memorable

expedition in the United States, and returned to South America, with the view of establishing a republic at Caracas. He succeeded in 1812 in maintaining himself against Spain at the head of an army of insurgents, and was supported in his patriotic attempts by the British and American governments; but he was delivered by Bolivar into the hands of the Spaniards, and carried to Cadiz, where he died after 4 years' imprisonment. —See "History of Miranda's attempt to effect a revolution in South America" (New York, 1808).

MIRANDOLA, GIOVANNI PICO DELLA, count and prince of Concordia, an Italian scholar, born at Mirandola, Modena, Feb. 24, 1463, died in Florence, Nov. 17, 1494. Almost from childhood he displayed an extraordinary memory. At the age of 14 he was sent to Bologna to study canon law; but soon abandoning that pursuit, he repaired to Ferrara and applied himself to philosophy, theology, and languages. Voltaire cites the example of this precocious youth as evidence of the superior state of learning in Italy at that period. After becoming master of all the learning of the time, he proceeded to Rome in 1486, and propounded 900 theses as subjects of controversy to the learned men of the eternal city. His challenge was not accepted, but some rigid theologians denounced 18 of his propositions to the pope, Innocent VIII., as heretical; and though he ultimately succeeded in proving their orthodoxy, he suffered much persecution. These trials made a deep impression on his mind, and induced him to give up the study of profane literature and to devote his attention in future to religion and philosophy. Resigning his principality in favor of his nephew, he lived in the utmost retirement at Florence until his death, a year before which Pope Alexander VI. had absolved him of all heresy. A collective edition of his works was published at Basel in 1601. His biography has been written by the Rev. W. Parr Greswell (Manchester, 1806).

MIRBEL, CHARLES FRANÇOIS BRISSEAU DE, a French naturalist, born in Paris, March 27, 1776, died Sept. 12, 1854. He was originally by profession a painter and designer, and about 1800 became superintendent of the gardens and conservatories of Malmaison. About the same time he lectured on botany in Paris. In 1806 he became a member of the institute, and soon after was appointed assistant professor of botany and vegetable physiology to the faculty of sciences in Paris. Between 1817 and 1827 he held a variety of public offices, but in the latter year resumed his scientific pursuits, and in 1829 was appointed professor of culture at the museum of natural history. He was one of the first to apply the microscope to the examination of the internal structure of plants. Several years before his death he resigned his professorships, and in the latter part of his life he carried on an acrimonious controversy with Gaudichaud on the growth of vegetables. His works comprise: *Traité de physiologie végétale* (2 vols. 8vo., Paris, 1802); *Exposition de la théorie de l'organisation végétale* (8vo., Am-

sterdam, 1808); and *Éléments de physiologie végétale et de botanique* (2 vols. 8vo., Paris, 1815). He also took an important part in the preparation of Sonnini's *Cours d'histoire naturelle*, designed as a continuation of the "Natural History" of Buffon, 5 of the 18 volumes devoted to the history of plants being written by himself; and he contributed many papers to the *Annales* of the museum and the *Mémoires* of the academy of sciences, including a celebrated one on the "Anatomy and Physiology of *Marchantia Polymorpha*," in which he described the general structure of the plant and the history of the development of its embryo.

MIRIAM, the sister of Moses the Hebrew lawgiver, and of his brother Aaron. She was present on the bank of the Nile when the daughter of Pharaoh found the child Moses, who had been exposed in a basket on the river, and called her mother Jochebed, the wife of Amram, to nurse him for the princess. After the passage of the Red sea, she sang a triumphal song, of which the commencement only is recorded. Having together with Aaron spoken against Moses in the desert, on account of his having married an Ethiopian (Onshite) woman, she was struck with leprosy, and was excluded from the camp 7 days. She died in Kadesah, and was buried there.

MIRROR (Fr. *miroir*), a looking glass or speculum—any bright surface that reflects the rays of light falling from objects upon it. The surface of smooth water is a natural mirror, which the ancient poets sometimes refer to as having been used for this purpose by goddesses and shepherdesses. Metallic mirrors are mentioned in Exod. xxxviii. 8, and Job xxxvii. 18. With the ancient Egyptians one of the principal articles of the toilet was the mirror. Wilkinson states that it was of mixed metal, chiefly copper, carefully wrought and highly polished. It was of circular form and attached to an elaborately ornamented handle, the designs of which were sometimes beautiful female figures, and sometimes hideous monsters, whose ugliness contrasted most strongly with the features reflected by its polished surface. The practice of using polished basins for mirrors is alluded to by Artemidorus; and the ancients also had drinking vessels, as mentioned by Pliny, the inside of which was so cut and polished that the image of one drinking from them was reflected many times multiplied. The composition of some of the ancient mirrors has been found by William Francis to have been: copper 67.12, tin 24.98, and lead 8.18 parts in 100; and by Klaproth: copper 62, tin 32, and lead 6 per cent. Their manufacture appears to have been most extensively carried on at Brundisium. Pliny gives to Praxiteles the credit of introducing mirrors of silver. They are spoken of by Plautus, and in the 4th century B. C. they became very common among the Romans, so that they were in use, according to Pliny and Seneca, even by maid servants, and the manufacture of them was one of the important

trades of Rome. Mirrors of gold are sometimes alluded to, but these are probably so named rather from the material of their frame or ornaments than of the reflecting substance. In order to keep the mirrors bright they required frequent polishing, and for this purpose they were generally furnished with a sponge containing pulverized pumice stone, with which they were often rubbed. They were for the most part of small size, and were held by female slaves before their mistresses when dressing; an office, as appears from Ovid, sometimes also performed by the lover. Mirrors were also made of sufficient size to reflect the whole person, *specula totis paria corporibus*, and were affixed to the walls. Such must have been the mirror of Demosthenes mentioned by Plutarch, Lucian, and Quintilian. Reference is also made to apartments lined with mirrors. From several statements of Pliny it appears that various stones were employed as mirrors, set into the walls as panels, and otherwise used to reflect images of objects. The obsidian appears to have been the variety of stone most employed for this purpose. A similar stone called the *istiti*, and by the Spaniards *gallinazo*, was used for the same purpose by the Aztecs of Mexico, of which hard vitreous stone they also fashioned sword blades and razors. There were other stones also of which when polished they made excellent mirrors; but the description of these is too indefinite to determine their names.—Beckmann thinks that the use of the dark obsidian stone for mirrors suggested the use of glass, that this was attempted at the celebrated glass works of Sidon of which Pliny makes mention, and that they were first made of black glass, and afterward of glass covered on the back with black foil. But from the time of Pliny no certain reference is again found to glass mirrors until the 18th century. In the treatise on optics of Alharen, the Arabian, of about the year 1100, mention is made of mirrors of iron (steel) and also of silver, but not of glass; and the same thing is remarked of the "Optics" of Vitello, of about the middle of the 13th century. But in the treatise on optics of Johannes Peckham, an English Franciscan monk, who taught at Oxford, Paris, and Rome, and died in 1292, mirrors of iron, steel, and of polished marble are spoken of, and also of glass covered on the back with lead. After this time various writers allude to mirrors of this sort, and describe their being made by pouring melted lead over the hot glass plates. In the 14th century glass mirrors were extremely rare in France, while metallic ones were in common use. The mirror of Anne of Brittany, consort of Louis XII., was of the latter sort. Beckmann describes the following method of preparing small convex glass mirrors as common in Germany in the beginning of the 16th century. A hollow ball of glass being blown, while still hot a metallic mixture of lead or tin or antimony, with a little resin or salt of tartar, was introduced into it, and coated its inner surface, the resin or

salt aiding the fusion of the metal and preventing its oxidation. The glass, being entirely coated within, and having become cool, was cut into small round mirrors. It is not many years since they were sold in Germany by the name of *Ochsenaugen*, ox eyes. They were set in a round painted board, and had a very broad border, and reflected a diminished but very clear image. The coating of glass with an amalgam of tin foil and mercury was practised by the Venetians in the 16th century. The process, as described by Porta, who witnessed it at Murano, consisted in spreading the tin foil smoothly upon a plane surface, and pouring upon it mercury, which was rubbed in with the hand or a hare's foot. The amalgam thus formed was then covered with a sheet of paper, and the glass being laid upon this and pressed down, the paper was drawn out. Weights were then laid upon the glass, and it was left for some time for the excess of mercury to drain off. The introduction of this manufacture into France is noticed in the article GLASS, vol. viii. p. 282. The chief modern improvement in the art consists in the use of very large plates, the process of coating them not differing essentially from that of the Venetians 800 years ago. The present method is as follows: A large stone table, ground perfectly smooth, is so arranged as to be easily canted a little on one side by means of a screw set beneath it. Around the edges of the table is a groove, in which mercury may flow and drop from one corner into bowls placed to receive it. The table is first made perfectly horizontal, and then tin foil is carefully laid over it, covering a greater space than the glass to be coated. A strip of glass is placed along each of 3 sides of the foil to prevent the mercury from flowing off. The metal is then poured from ladles upon the foil till it is nearly a quarter of an inch deep, and its tendency to flow is checked by its affinity for the tin foil and the mechanical obstruction of the slips of glass. The plate of glass, previously cleaned with especial care, is dexterously slid on from the open side, and its advancing edge is kept in the mercury, so that no air or floating oxide of the metal nor other impurities can get between the glass and the clean surface of the mercury. When exactly in its place, it is held till one edge of the table has been elevated at an angle of 10° or 12° and the superfluous mercury has run off. Heavy weights are placed on the glass, and it is left for several hours. It is then turned over and placed upon a frame, the side covered with the amalgam, which adheres to it, being uppermost. In this position the amalgam becomes hard, and the plate can then be set on edge; but for several weeks it is necessary to guard against turning it over, as until the amalgam is thoroughly dry the coating is easily injured.—There are several serious difficulties attending this process. The health of the workmen is so affected by the fumes of the mercury that they can rarely follow the business more than a few years; for this no

remedy has been found so effectual as thorough ventilation and the frequent use of sulphur baths. The glass plates are liable to be broken by the weights placed upon them; and the coating of amalgam is frequently spoiled by the drops of mercury removing portions of it as they trickle down, or by its crystallizing, or by mechanical abrasion. Many methods of silvering have been contrived and patented with the view of obviating these defects; few of them, however, are of any importance. In 1855 a patent was granted in England to Tony Petitjean for a method of precipitating silver, gold, or platinum upon glass, so as to form a coating upon it, by the use of two solutions, the effect of which when mixed upon the glass is to mutually decompose each other. The solutions he employed were different compounds of ammonio-nitrate of silver, tartaric acid, and distilled water; and they were placed upon the plate while this was at the temperature of 150° F. The precipitated silver within 20 minutes covered the glass, to which it adhered; and the solution being then turned off, all that remained to complete the mirror was to wash the surface, and when dry cover it with a coat of varnish to protect it from injury. The silvering thus obtained is not so white, and is rarely so free from blemishes, as the amalgam coating. In 1849 Mr. Drayton made known a similar method, an improvement upon an older process of his which he patented in 1843. He employed ammonia 1 oz., nitrate of silver 2 oz., water 3 oz., and alcohol 8 oz.; these, being carefully mixed, were allowed to stand a few hours, when to each ounce of the liquid was added an ounce of saccharine matter, as of grape sugar, dissolved in equal portions of spirit and water. Baron vom Liebig has recently invented a new method of coating glass with silver, and with some associates has established a manufactory of looking glasses near Nuremberg. In his process, after the silver coating is laid on, it is covered with a coating of copper precipitated upon it by the galvanic current. The brilliancy of aluminum has caused the suggestion of its application to the coating of mirrors; but no successful experiments have yet been made with it for this purpose. Mirrors of large size are made in the United States by coating the imported plates. The old amalgamation method with tin foil and mercury is preferred to any of the more recent inventions, by reason of the greater whiteness and brilliancy of the reflection and the greater permanency of the coating.—For telescopes, philosophical instruments, and light-houses, various sorts of mirrors are in use, and reference to them may be found under various heads in this work, as BURNING GLASS, FRESNEL, LIGHTHOUSE, OPTICS, REFLECTION, SPECULUM, TELESCOPE, &c. Concave mirrors serve to concentrate the rays of the sun in one point and produce intense heat.

MISDEMEANOR. Offences less than treason are, in law, divided into felonies (see FELONY) and misdemeanors. Any crime less than

a felony is a misdemeanor. Statutes sometimes declare that the offences which they contemplate shall be punishable as misdemeanors, but the term applies equally to all those crimes, whether of commission or of omission, for which the law has not provided a name. Misdemeanors are either those which exist at common law, *mala in se*, or they are those which are created by statute, *mala prohibita*. Under the former class, whatever, in the language of Blackstone, mischievously affects the person or property of another, openly outrages decency, disturbs public order, is injurious to the public morals, or is a corrupt breach of official duty, is indictable as a misdemeanor at common law. This doctrine is particularly pertinent in the United States, because many of the offences which in England were exclusively cognizable by the ecclesiastical courts, or fall within the specific enactments of the penal code, are here construed and adjudicated according to the general principles and analogies of the unwritten law. In the United States it has been held to be an indictable misdemeanor at common law to drive a carriage along the crowded street so as to endanger the lives of foot passengers; to go armed with dangerous and unusual weapons; to disturb a town meeting or a congregation engaged in religious worship. It is an indictable nuisance and scandal to the community to disinter a dead body without lawful authority; to throw a corpse into a river without the rites of Christian burial; to sell knowingly unwholesome provisions; to be guilty of notorious lewdness or drunkenness; to indulge publicly in profane swearing and blasphemy; or to let a house knowing that it is to be used for the purpose of prostitution. This last doctrine, however, is not admitted in New York. So it has been held to be a misdemeanor, indictable at common law, to deposit more than one vote upon a single balloting; to kill a tree standing upon public ground; to treat an animal with wanton cruelty; to send threatening letters; or to give a challenge to fight.—Misdemeanors which are created by statute are of two kinds. The one kind embraces those which consist in the omission or commission of an act enjoined or forbidden by the statute, though the transgression be not specially made the subject of indictment. For when a statute prohibits a matter of public grievance or commands a matter of public convenience, all infractions of its provisions are indictable, unless this mode of proceeding be positively excluded; because the doing what competent authority forbids, or not doing what it requires, is itself an offence at common law. The second kind includes those statutory offences which are made specially indictable. If the punishment is expressly defined, the provision of the statute must be strictly followed. If the statute merely attaches a new penalty to what was already a common law offence, the remedy may be pursued either as at common law or under the statute. In the English law, when a statute makes that felony which was

only a misdemeanor before, the smaller offence is merged, and there can be no prosecution or conviction for the misdemeanor. But the peculiar reasons for this rule of the English practice have no application in the United States; and it is the rule in New York and in Massachusetts (though in the latter state the English practice prevailed until it was changed by statute), that upon an indictment of felony there may be conviction of misdemeanor if there be evidence enough to make out the less offence.—In respect to misdemeanors, the distinction between principals of the first and second degree is unknown; and those who in treasons and felonies would be accessories after the fact, are themselves liable for the commission of a distinct misdemeanor.—The ordinary punishment of misdemeanor at common law is fine and imprisonment, or either of them in the discretion of the court; and these are regularly inflicted when no other penalty is prescribed. In Connecticut it has been decided that the fine must be less than the whole value of a man's property, and that the imprisonment must be for a less term than the whole of his life. Finally, in all sentences for misdemeanor, the court may require the defendant to give bonds to keep the peace. It is inconsistent with the general policy of the law to allow a criminal charge to be referred to arbitration or to any other mode of private settlement. An agreement to compound a felony has always been held entirely illegal and void. Properly speaking, indeed, the injured party has nothing to compromise. A crime, whatever be the degree of its criminality, is committed against the public order, and it is therefore only upon a public prosecution that the matter can be disposed of. Yet in the slighter offences against the public peace, a compromise, it is said, may be valid. Quoting from Mr. Chitty's notes to the English statutes of arbitration, Mr. Justice Patteson said in a late English case, that such penal offences as assault, libel, nuisance, and the like, for which an action of damages would lie, may be submitted to arbitration at common law; and although an indictment has already been preferred, the matter of complaint may still be referred by leave of court. Plainly, nothing can prevent an injured individual from submitting to arbitration the private wrong which may be measured and compensated by damages. But the public wrong done, in the slighter misdemeanors even, cannot, in strictness, be removed from public cognizance except by consent of the proper authority. Hence it seems to be the common law doctrine that though, in such misdemeanors as those just referred to, where the public interest is but little concerned, the criminal process will be waived almost as matter of course upon acknowledgment of private satisfaction, yet express or implied consent of the court to the waiver is still essential to the valid compromise of the matter. This doctrine of the common law is carried out in those statutes by which in several states it is provided, that upon

a criminal charge of assault and battery or other misdemeanor for which a remedy by civil action is given, if the injured party appear before a magistrate and acknowledge that he has received satisfaction, the accused may, or in some cases shall, be discharged on payment of costs.

MISERERE (Lat., have mercy), the name applied in the Roman Catholic church to the 51st Psalm, which commences in the Vulgate with that word, and is specially employed as a penitential hymn. The words of this Psalm have frequently been set to music by eminent composers, the *Miserere* of Allegri, performed annually in the Sistine chapel in Rome in Passion week, being particularly famous; and the term is now commonly applied to any sacred composition of a penitential character.

MISHNA, or **MISHNAH** (late Heb., study), the earlier part of the Talmud, forming a compendium of decisions, based on oral traditions, respecting the laws and religious rites of the Jews, and first systematically arranged by the patriarch Rabbi Judah the Holy and his school, toward the close of the 2d, or according to others in the early part of the 3d century. It is written in Hebrew, and divided into 6 principal parts and 63 subdivisions. Of the former, the 1st treats chiefly prayers and the duties of husbandmen; the 2d, festivals; the 3d, marriage relations; the 4th, judicial subjects; the 5th, matters concerning the temple; and the 6th, the institutions respecting purification. (See **HEBREW**, and **TALMUD**.)

MISKOLCZ, a town of Hungary, capital of the county of Borsod, on the Szinva, near its embouchure in the Sajó; pop. about 80,000. It is situated at the foot of a vine-clad mountain called Ávas, and has numerous institutions of learning. The inhabitants, consisting of Magyars, who form the majority, Rascians, Slovaks, Germans, and Jews, are actively engaged in trade and manufactures; and the town is connected by railway with Kaschau on the one side, and Debreczin on the other. In the vicinity are the iron works of Diós Györ, in a picturesque valley, at the upper end of which is a mountain lake, and the mineral waters of Tapolca.

MISSAL (Lat. *missale*), in the Roman Catholic church, a book which contains the services of the mass for the various days of the year. In the ancient church, the several parts of divine service were arranged in distinct books. The *Sacramentarium* contained the collects and the invariable portion of the communion office; the *Antiphonarium*, the anthems to be chanted at the beginning, after the epistle, at the offertory, and at the communion; the *Lectioarium*, the lessons from the Old Testament, the Acts, the Epistles, and the Apocalypse; the *Evangeliarium*, sections from the four Gospels. Each of these parts was sometimes called *Liber Missalis* (mass book), especially the first. The Roman church had three celebrated sacramentaries: 1, the *Sacramentarium Leonianum*, published by Blanchini in 1785, and sup-

posed by its first editor to have been arranged by Leo I., an opinion which is now rejected by most Catholic writers (Muratori, Ballerini, Luft, &c.), who ascribe its origin to an unknown author about the end of the 5th century; 2, the *Sacramentarium Gelasianum*, generally ascribed to Gelasius I. (died 496); 3, the *Sacramentarium Gregorianum*, by Gregory I. (died 604). A collection containing all the 4 books used at the mass was called *Missale Plenarium*, and later simply *Missale*. Such missals were in common use long before the council of Trent, which discussed the necessity of a revision, and referred its execution to the pope. The revision was commenced under Pius IV. and published under Pius V. The revised missal was published on July 14, 1570. New revisions were made under Clement VIII. (1604) and Urban VIII. (1684). The Roman missal consists of three principal parts: 1, the *Proprium Missarum de Tempore*, containing the formularies for the masses of the Sundays; 2, the *Proprium Missarum de Sanctis*, containing special formularies of mass for the festivals of a number of saints; 3, the *Commune Sanctorum*, containing general formularies for classes of saints (as apostles, martyrs, confessors, &c.), serving as an appendix to the second part for such saints as have no special service assigned them. The *Ordo Missæ*, containing that part of the mass which is invariable, is inserted in the first part of the missal between Saturday of the Passion week and Easter. (Concerning the Ambrosian, Mozarabic, and Gallican missals, see **LITURGY**.) Some dioceses and religious orders have in an appendix special formularies for the masses of saints whose festivals are celebrated by them with greater solemnity than in the rest of the church. (For the illumination of missals, see **MINIATURE PAINTING**.)

MISSINNIPPI RIVER. See **CHURCHILL**.

MISSIONS, FOREIGN. In a theological sense, this term denotes the efforts made by the professors of a religious creed to propagate their doctrines in countries following other religious persuasions. The disciples of Christ received from their master the command: "Go ye into all the world, and preach the gospel to every creature." In compliance with this call, the apostolic church at once began missionary operations on a larger scale than the world had ever seen before. Unfortunately the records of this first brilliant period of the missionary history of the church have been mostly lost; but enough has been preserved to show that the doctrines of Christianity were taught by the apostles themselves and their disciples far beyond the confines of the Roman empire. Toward the close of the 1st century the heroic missionary efforts of the church had called into existence numerous and flourishing congregations in the towns of Asia Minor, Greece, Italy, the islands of the Mediterranean, northern Africa, India, and probably several other countries. In the 2d and 3d centuries we see the missionaries successful in southern Germany, Gaul, Arabia,

and Ethiopia. Under Constantine Christianity became the state church, and the custom was gradually introduced of using coercive measures for the advancement of the Christian doctrines. The missionary zeal seems not to have abated, but it is frequently difficult for the historian to determine what share the missions and what the secular arm had severally in completing the Christianization of the various countries constituting the Roman empire. Ireland (the "isle of the saints") and Scotland soon became the most celebrated nurseries of great missionaries, who in particular labored for the conversion of the Germanic tribes. Emmeranus, Corbinianus, Columbanus, Gallus, Boniface, and Anscarus are among the most celebrated apostles of northern Europe. In the East, Iberia, Armenia, and Persia were the most important missionary fields. After the separation of the eastern church from the western, the interest in the missionary cause almost wholly ceased in the former. The progress of Christianity eastward was arrested, while a considerable portion of its own territory was taken possession of by the Mohammedans. The Nestorians continued for a long time to carry on, especially in China and India, successful missionary operations, of which little is now known. The Latin church continued her spiritual conquests in northern Europe. The Scandinavian kingdoms were gained over one after another in the 10th and 11th centuries. Cyril and Methodius opened to Christianity the way to the great Slavic race, by preaching to the Khazars, Bulgarians, and Moravians. Adalbert, bishop of Prague, was martyred in a mission among the Prussians. From Iceland, whose Christianization was completed about 1000, missionaries accompanied the adventurous Norsemen on their expeditions of discovery; and Greenland is believed to have received at that time the first account of Christianity and the first foundation of a Christian church. The extension of Latin Christianity in northern Europe is however more due to the laws and wars of the princes than to the zeal of missionaries, though in almost every country devoted missionaries were not wanting, who cheerfully risked their lives in preaching to the native pagans. A new missionary zeal awoke in the Roman Catholic church after the foundation of the mendicant orders, which endeavored to excel each other in extending the territory of their church. Innocent IV. in 1245, and St. Louis in 1248, sent mendicant friars as missionaries among the Mongols; and in 1289 John de Monte Corvino translated the New Testament and Psalms into the Tartar language. Several bishops were appointed for China, where the mission assumed large dimensions, but half a century later it was nearly exterminated. Toward the close of the 14th century the Franciscans supported a flourishing mission in northern Persia, with about 10,000 adherents. The missionaries to the East did not confine their labors to the pagans, but also endeavored to bring about a union of the eastern episcopal denomi-

nations, and were partly successful in the case of the Greeks, Armenians, Copts, and others. In the 15th century Portuguese missionaries settled in the islands discovered by their countrymen, and with the aid of the secular arm soon and easily effected the nominal Christianization of Madeira (1418-'20), of the Azores (1482-'57), and of several districts along the African coast (1486-'97). Very extensive new fields for missions were opened by the discovery of America in 1492, and the circumnavigation of the cape of Good Hope in 1497. Great numbers of missionaries volunteered to be sent to the newly discovered countries, and in the East as well as West Indies missionary operations were commenced on a very large scale. In the East Indies the bishopric of Goa was established in 1520 under Franciscan missionaries, several other bishops for the East were appointed, and sent out by the Portuguese government, and a large part of the Christians of St. Thomas were prevailed upon to unite with the Roman Catholic church. In Mexico and Central and South America, the 16th century completed the victory of the Roman Catholic missions, as far as the country was under the dominion of the Spaniards and the Portuguese. In many instances, however, the aid of the inquisition was invoked to suppress the pagan worship.—An extraordinary impulse to missionary labors was given by the establishment of the order of the Jesuits, as all the members of the new order took a vow to go as missionaries into any country whither it might please the pope to send them. As, shortly before the foundation of their order, a large part of Europe had separated from the Roman Catholic church, they directed their efforts equally to the conversion of the pagans and to inducing the Protestants and eastern Christians to submit again to the authority of the pope. St. Francis Xavier, the apostle of the Indies and Japan, surpassed all Christian missionaries who had lived since the apostolic age in the extent of his missionary travels, and in the number of converts whom he baptized. At the time of his death about 100 Jesuits were laboring in the East Indies. Soon after, the east of Asia presented the brightest prospects. The Philippines in 1571 became a Catholic country, under Spanish dominion; and even in the mighty empire of Japan the conversion of a number of princes promised the speedy victory of Christianity, when internal wars and dread of foreign rule called forth (after 1587) a bloody persecution, which ended in the second half of the 17th century in the complete extirpation of Christianity. In China, several Jesuits, especially Ricci and Schall, obtained great influence at the court by means of their astronomical and mathematical knowledge, and among the educated classes of the people by the classic works which they composed in the Chinese language; and this extensive influence was used with great success in gaining converts for their creed. While Spanish missionaries from Mexico were pressing northward, the French in

1608 began to send missionaries to North America, and established prosperous settlements among the Abnakis, Hurons, Iroquois, and other Indian tribes. Biard and Brébeuf were the most celebrated among those who devoted their whole lives to thoroughly organizing the colonies of native Christians. The French missions gradually advanced up the St. Lawrence and along the lakes. In Abyssinia repeated efforts were made from 1550 to 1684, mostly by Jesuits, to bring the national church, which had been isolated from the rest of the Christian world for more than 1,000 years, into an organic connection with the Roman Catholic church. Several princes entered into their views, and a member of the Jesuit order was appointed patriarch; but at length a successful insurrection thwarted the project. Several other portions of Africa received Catholic missionaries in the course of the 17th century, as Morocco (1680) and Madagascar (1648), but without permanent success.—In the 18th century the Jesuit missions in the East greatly declined. In China and India they were involved in a controversy with the Dominicans respecting certain accommodations to native customs, which the Jesuits regarded as lawful, while the Dominicans stigmatized them as idolatrous. Rome decided against the Jesuits; and from that time the prosperity of their missions declined. In China, moreover, a fierce persecution broke out against the Christians, which between 1722 and 1754 diminished their number from 800,000 to 100,000. In Thibet, the Capuchins tried to establish missions, but with only slight success. A larger number of conversions were made in Indo-China, especially in Cochin China and Tonquin, and the Catholic population gradually rose to several hundred thousand, mostly attended by native priests. A firm foundation, amid the continuance of persecution, was also laid in Corea. In Africa a third attempt was made (1750-'54) to unite the Abyssinian church with Rome, but without success. The Portuguese missions on the W. coast of Africa almost entirely decayed. In the Spanish and Portuguese possessions of America the progress of the missions among the Indians was completely arrested by the expulsion of the Jesuits, and the attitude which the governments of Spain and Portugal assumed toward the Roman Catholic church. The French revolution toward the close of the 18th century greatly diminished the power and resources of the Roman Catholic church, in consequence of which nearly all the foreign missions declined, while some were given up entirely. Since 1814 the operations in the various missionary fields have again been taken up with renewed zeal; the number of missionary bishops and priests has been greatly increased, but no extraordinary successes have as yet been announced. In China proper, in Corea, and in India, the Catholic population has, however, considerably risen. Cochin China and Tonquin enjoyed likewise for some time a season of great prosperity, until, about 1858, the persecution to which more or

less the Christians were generally exposed assumed such dimensions that nearly all the priests were killed or obliged to flee, and nearly every congregation was scattered. This led in 1858 to an intervention of the French and Spaniards, who, however, up to 1860, had only possessed themselves of a small tract of coast land, without compelling the government to cease the persecution. Japan was reopened to Catholic missionaries in consequence of the treaties of 1859, and was at once occupied as a mission field. The missions in Turkey, and more particularly those among the eastern churches, were greatly enlarged, and considerable numbers of Armenians, Jacobites, and Nestorians entered into union with Rome. The same step was taken, in 1859, by the king of Tigre in Abyssinia, with 50,000 of his subjects. The conquest of Algeria by the French gave rise to some enterprises for the conversion of the Mohammedans, but without notable results. Special missionary associations were formed in Austria for Khartoom in Nubia, and in France for western Africa; but the majority of missionaries were swept away by the deadly climate soon after their arrival at the missionary stations. In North America, the labors among the Indians were taken up again, especially by the Jesuits, and the missionaries advanced up to the northernmost settlements in the British possessions; but nothing of importance has been done for the pagan Indians in the countries south of the United States. In Australasia numerous congregations of natives have been formed, especially in New Zealand; several smaller islands, as Wallis and Futuna, have been wholly gained for the Roman Catholic church; and, under the patronage of the French, a firm footing has also been obtained in some islands which had been pre-occupied by Protestant missionaries, as Tahiti and the Sandwich islands.—The Roman Catholic church has a number of institutions for the training of missionaries. The oldest and most celebrated among them is the propaganda in Rome. (See PROPAGANDA.) Other institutions of this kind are Greek, German, English, Irish, Scotch, Belgian, and South American colleges at Rome, and the Chinese college in Naples, founded in the first half of the 18th century by an Italian missionary in China. All the pupils are natives of China, who, after being ordained as priests, return to their country as missionaries. The Greek seminary at Palermo educates priests for the United Greeks. The American college at Rome for the training of missionary priests for the United States was opened by Pius IX. in 1859. The seminary of foreign missions at Paris is probably the most fruitful nursery of Roman Catholic missionaries; it supplies a number of the missionary dioceses in China and Indo-China. The college of Old Hallows, near Dublin, Ireland, is of growing importance. The number of its pupils amounts to about 100. It mostly trains priests for Irish emigrants to Protestant countries; but many of them are

by the situation of their stations called upon to preach to heathen also, especially those in India. Moreover, most of the religious orders educate a number of their members for foreign missions, and some of them have special houses for this purpose. A number of missionary dioceses in pagan countries are intrusted by the propaganda to the several orders, which engage to send there the necessary number of missionaries. Those most numerously represented in the foreign mission field are the Jesuits, Franciscans, Dominicans, Lazarists, the Picpus society, the Mariats, Capuchins, and Carmelites. There are also supported in the missions a number of seminaries for the training of a native clergy, of which that at Penang in British Asia is one of the largest.—The first general association for the support of Catholic missions was formed at Lyons, France, in 1822, under the name of the "Society for the Propagation of the Faith." The society gradually extended over nearly all countries of the globe. Its members pledge themselves to pay one *sou* a week. Its total receipts in 1859 amounted to 7,117,795 francs, and its expenditures to 4,561,589 francs. It publishes a bi-monthly periodical, the "Annals of the Propagation of the Faith," of which 204,950 copies are issued in the French, German, English, Italian, Spanish, Portuguese, Dutch, Flemish, and Polish languages. The society contributes to the support of all Roman Catholic missions. An important auxiliary to this society is the "Association of the Holy Childhood of Jesus," a children's missionary society, for baptizing and rescuing pagan children of China, and, if possible, for providing a Christian education for them. Its annual receipts amount to about 1,000,000 francs. The Leopoldine association in Austria, and the Louis association of Bavaria, support almost exclusively missions among the German emigrants in North America. The St. Mary's association of Austria was established for the sole support of the Austrian missions in Khartoom. France has special associations for the support of the missions in western Africa, for the foundation of Christian schools in Turkish Asia, and for missions among the Mohammedans.—The principal Roman Catholic missionary fields in pagan countries at present are: China, with one bishopric in the Portuguese possessions, 21 vicariates apostolic, 8 prefectures apostolic, and a native Catholic population estimated at 387,000 souls; India and Ceylon, which have, beside one archbishop at Goa and 3 bishops for the Portuguese possessions, 20 vicars apostolic, and a population of 1,083,000 souls, of which only a very small portion are English, Irish, French, and Portuguese Catholics, the others being natives; Indo-China, with 10 vicars apostolic (2 in Siam, 3 in Cochin China, 1 in Cambodia, and 4 in Tonquin), and a population amounting at the outbreak of the new persecution in Cochin China to 520,000 native Roman Catholics. The Roman Catholic population of Africa live mostly in the Portuguese, French, English, and Spanish pos-

sessions. The most important missions among the pagans are carried on in and near the French possessions in Senegambia, in Natal, and in the country of the Gallas in central Africa. In Polynesia there are 7 vicariates apostolic for the native population. New Zealand is reported to have 15,000 native Roman Catholics, and the Sandwich islands 22,000. The membership of the church among the Indians of North America amounts to several thousands, and is constantly increasing. For more information on the history of the Roman Catholic missions, see Wittmann, *Die Herrlichkeit der Kirche in ihren Missionen* (Augsburg, 1841); Hahn, *Geschichte der katholischen Missionen* (Cologne, 1857 et seq.). A rich source of information are the *Lettres édifiantes*, extending from 1717 to 1774, and from 1780 to 1787, and the *Annales de la propagation de la foi* since 1822.—PROTESTANT MISSIONS. The principal reason why the Protestant churches did not engage extensively in foreign missionary enterprises during the first period of their existence, must be sought in their precarious position at home, and their struggles against powers which for a long time refused to acknowledge their legal existence. Yet the founders, the divines and the princes of the reformed churches, were by no means unconscious of the missionary duties of the church. Luther took frequent opportunity to remind the Christians of the "misery of pagans and Turks," and to exhort to prayers for them, and to the sending out of preachers. Like him all the prominent theologians of his times speak of the duty of the church to preach the gospel to the unbelieving. The earliest attempt at a Protestant foreign mission was made in 1555. A knight of Malta, Villegagnon, began, under the patronage of Henry II. of France, the formation of a French colony in Brazil, and, on the promise that the reformed religion should be taught there, 14 spiritual teachers were furnished by Calvin. On landing in 1556, they immediately set themselves to work in the organization of the future church, but their efforts were soon arrested, as Villegagnon demanded and obtained their return to France. Some evangelical princes showed a great interest in the cause. Gustavus Vasa of Sweden (1528-'60), in whose dominions paganism still existed among the Lapps, founded a mission among them, which was vigorously supported by some of his successors, especially by Charles IX. (1602-'11). Many of the German princes, as Duke Christopher of Wurtemberg and Duke Ernest the Pious of Saxo-Gotha, made great efforts to awaken an interest in the missionary cause. In 1664 a German baron, Ernest von Wels, published two pamphlets in order to awaken a greater interest in foreign missions, and proposed the formation of a "Jesus Association" for the propagation of Christianity among the pagans. But few German theologians supported him, and the majority called him a fanatic and heretic. Wels then went to Holland, to be there ordained as a minister, and

then set out as a missionary to Surinam, where he soon fell a victim to his zealous labors. About this time three Protestant nations, the Dutch, English, and Danae, began to wrest from the Spaniards and Portuguese many of their transmarine possessions, and thus to open to Protestant missionaries a vast field of labor. The Dutch founded a number of colonies on the Molucca islands, Ceylon, and Sumatra, and displayed a great zeal in gaining the natives for the Reformed church. The motives and means of these missionary efforts were not always pure; thus, the governor of Ceylon declared that only those natives would get any kind of employment from the government who would sign the Helvetic confession. This declaration induced thousands to demand baptism, which was generally refused to none who were able to recite the Lord's Prayer and the Ten Commandments. At the close of the 17th century about 300,000 Cingalese had been baptized. There were, however, many devoted missionaries, who earnestly labored to spread a spiritual Christianity. The learned Walaeus of Leyden advocated the formation of a missionary seminary, and the Dutch East India company cordially approved of the scheme, the execution of which proved eminently useful to the cause of reformed religion.—The settlement of New England by a company of nonconformists (1620) was soon followed by the arrival of John Eliot, who became deeply interested in the religious condition of the North American Indians. In 1646, after mastering the language, he formally entered upon a mission, with the Mohegan version of the Bible as the fruit of his own unaided labors. Among those who assisted him were John Cotton and the Mayhews. The short career of Thomas Mayhew, the first missionary of this family, was rewarded by the sight of nearly 300 Indian converts. Five successive generations of the Mayhews continued these labors in behalf of the Indians. In 1674 the Indians of the district were about 3,000, half of whom professed Christianity; but in 1792 they had decreased to 440.—A vast scheme of uniting all the Protestant churches of the world into one great missionary society was conceived by Cromwell. He intended to establish a Protestant college for the defence and propagation of the evangelical faith, which was to consist of 7 directors and 4 secretaries, and to receive from the state a fixed annual support. The whole earth was divided into 4 missionary provinces, each of which was to have its representative in the college. Though this scheme was not carried through, it prepared the English nation for an active support of the missionary societies which soon after sprang into existence. The formation of the first great missionary society of the Protestant world took place at the beginning of the 18th century. Some members of a "Society for promoting Christian Knowledge," which had been founded in 1698, constituted themselves in 1701 a committee for sending missionaries to the pagans. They assumed the name

of "Society for the Propagation of the Gospel in Foreign Parts," and the new association was sanctioned by William III. The original design was the formation of colonial churches, and mostly for this purpose the operations have been extended to the East and West Indies, southern Africa, the Seychelles, Australia, Tasmania, and New Zealand. An interesting circumstance in connection with this society is, that in 1735 John Wesley went to Georgia as its pioneer missionary. In 1859 it had 414 ordained missionaries, and 700 other agents paid and unpaid. Its gross income was reported at the anniversary of 1860 as amounting to £115,430. It is under the control of the Church of England, and the influence of the "high church" school at present prevails in its management. The "Scottish Society for propagating Christian Knowledge," founded in 1709, labored for some years among the North American Indians, but without permanent success.—Denmark, though it had begun in 1620 to found colonies in the East and West Indies, made no missionary exertions in behalf of the pagans until the reign of Frederic IV., who in 1711 established an annual appropriation of 2,000 rix dollars for missionary purposes, and organized in 1714 the royal college of missions. Unable to find the proper persons for foreign missions in Denmark, the government entered into arrangements with A. H. Francke, who furnished the first men, Ziegenbalg and Plutschow, for establishing a mission in Tranquebar. The society afterward extended their Indian missions considerably, though Denmark took very little interest in them. Most of the missionaries, among whom Christian Frederic Schwartz shone forth as a model, came from Germany, and the expenses for the missions in the territory of the East India company were mostly defrayed by the London society for promoting Christian knowledge. In 1835 the chief missions of this body were transferred to the society for the propagation of the gospel; and in 1844, when the last Danish possessions were transferred to Great Britain, the labors of the college of missions in India ceased altogether. The impulse given by King Frederic to the missionary cause called into existence two other remarkable enterprises. The one was a mission in Greenland, commenced in 1721 by a Norwegian pastor, Hans Egede; the other a new mission to Lapland, undertaken by the Norwegian Thomas von Westen. Both were conducted with great zeal and self-sacrifice. Egede induced the king to establish at Copenhagen a seminary, which trained catechists and missionaries for the Greenlanders, until the mission was wholly committed to the Moravians. It was in Copenhagen also that Count Zinzendorf received the first inspiration for the spreading of the gospel. On his return to Herrnhut (1732), the Moravians engaged at once in the cause with a zeal unprecedented in the history of Protestantism. The support of foreign missions was for the first time officially declared to be a duty

of the entire church, and an official board intrusted with taking charge of it. The guiding principles of the Moravians were to await a special call from God before going to any part of the pagan world, to avoid as much as possible selecting missionary fields preoccupied by others, and to give the preference to those countries which were among the most abandoned, difficult, and miserable. All the missionaries gained a part or the whole of their support by mechanical or agricultural labor; and the congregations of natives, which were all organized after the model of the church at home, were likewise bound to contribute for missionary purposes. Thus their enterprises stand forth as a great success. The fields which they occupied in succession were the Danish West India islands (1732), Greenland (1738), North American Indians (1734), Surinam (1735), South Africa (1736, renewed in 1792), Jamaica (1754), Antigua (1756), Barbados (1765), Labrador (1770), St. Kitts (1775), Tobago (1790, renewed in 1837), the Mosquito coast (1848), Australia (1849), and Thibet (1853). Altogether they reported in 1859, 14 missions, 600 missionaries, 143 stations, and 74,187 converts.—There is a great gap in the history of Protestant missions from 1732 to 1792. No new society was formed, and no efforts were made for the propagation of Christianity except by the few agencies mentioned above. Toward the close of the 18th century many circumstances worked together to prepare the dawn of a new period. A general dissatisfaction with the results of the rationalistic intellectualism began to pervade the Protestant nations, and a powerful counter-current led thousands back to a belief in the supreme necessity of experimental religion and personal piety. At the same time, members of all denominations longed to find ways and means to work together in fraternal union, in spite of denominational differences, for the common cause of Christianity. Free religious associations, not confined to the member of one particular denomination, became favorite institutions. The first foreign missionary society which was born out of this movement was the Baptist missionary society of England, established in 1792. The effect which its example produced throughout Christendom is unparalleled in the history of the Christian church. England first, and soon after America, multiplied their societies, until hardly a single Protestant denomination remained unrepresented. With the increase of societies kept pace the increase of their receipts, of the missionaries sent out, and of the converts from paganism. In continental Europe the interest in the missionary cause developed more slowly, but has of late received a new impulse. Every Protestant country has expressed a desire to do its share, and efforts are beginning to be made in several countries to unite all the evangelical missionary societies, for the sake of greater efficiency, into a kind of confederation.—A survey of all the societies of the Protestant world will best be obtained,

if we give a brief account: 1, of the British societies; 2, of the American; and 3, of those of continental Europe. I. *Great Britain.* The "Baptist Missionary Society" was founded under the overwhelming impression made by a sermon of William Carey, Oct. 2, 1792. Carey himself went forth as the first English missionary to India (1793), where soon Serampore became the centre of successful and extensive operations. A controversy between the Serampore mission and the parent society brought on a separation lasting 10 years, during which the two societies acted independently, but it did not arrest the progress of the mission. The Bible was issued from the Serampore press in 27 different versions, and the school operations were singularly prosperous. Among the missionaries, Marshman and Ward were especially distinguished. Beside India, the West Indies, western Africa, and France received missionaries from the Baptist society. In the West Indies, the churches in Jamaica separated from the home society in 1842, and charged themselves with the maintenance of the mission. In western Africa, the missionaries were expelled in 1858 by the Spanish government from the island of Fernando Po, and their missions forcibly suppressed. In 1859 the society reported 36 principal stations, 59 ordained missionaries (including 7 assistant missionaries), 144 other agents paid and unpaid, 5,118 church members (among whom were 4,636 natives), 6,164 children in their schools, and an income of £26,518. The General or Arminian Baptists started a separate society in 1816. They commenced a mission at Orissa in India in 1822, and at Ningpo in China in 1845. In 1859 they reported 7 stations in India, with 333 members, 9 chapels, and a nominal Christian community of 548. Their income was about £3,500.—The "London Missionary Society" owed its origin to a spirited paper in the "Evangelical Magazine," advocating the formation of a missionary society on the broadest possible basis. An invitation for that purpose was signed by 18 Independent, 7 Presbyterian, 3 Wesleyan, and 3 Episcopal clergymen; and the constitutive assembly took place Sept. 22, 1795, in a chapel of the countess of Huntingdon. The islands of the Pacific were selected as the first missionary field, and 29 young men selected from the large number of those who had offered themselves. On March 4, 1797, the missionaries landed on Tahiti and opened the first mission of the London society. Soon the society occupied also China and the East Indies, where Morrison and Milne prepared a translation of the Bible into Chinese, the islands of the Indian archipelago and Mauritius, southern Africa, the West Indies, Guiana, and North America. Their most important stations are at present those in the South sea, where Williams gained by his successful labors the name of an apostle of the Indians; and in southern Africa, where Moffat and Livingstone have distinguished themselves. In 1859 the society had 183 principal stations,

19,781 communicants, 735 educational institutions, including day and boarding schools, 83,625 scholars, 153 missionaries, and about 700 native agents. The society still adheres to its original broad basis, avoiding all denominational differences in point of doctrine and church government; but the subsequent organization of separate missionary societies, on the part of most of the English denominations, has left the London society mostly in the hands of the Independents. The "Church Missionary Society" for Africa and the East was organized April 12, 1799, by a number of distinguished men belonging to the evangelical school of the established church, among whom were Charles Simeon, Wilberforce, and others. The progress during the first years was slow, and no missionaries could be found in England, but the society had for some time to employ exclusively Germans. The first mission on the W. coast of Africa was unsuccessful, in consequence of the deleterious climate and the plots of the slave traders; but in Sierra Leone the missionary labors after 1818 were very prosperous. In 1814 the society had stations in India and New Zealand, in 1822 in N. W. America (Rupert's Land), in 1826 in the West Indies, in 1844 in China, and in 1857 in a new mission on the banks of the Niger. In 1859 the number of ordained missionaries (including about 50 natives) was 228, of other assistants 2,140, of communicants 16,281, and of scholars 83,546. The president of the society must always be elected from among the members of parliament. Vice-presidents are, according to a resolution of 1841, all the bishops of the Anglican church. Since 1825 the society has owned a missionary institute at Islington, which has room for 50 students, and generally counts about 80. The low church party of the establishment has always had a decided control over this society; yet all its missionaries have to submit to episcopal ordination and to subscribe the 39 articles; even the Germans who are employed by the society are now no longer exempt from the latter condition.—The first missions of the Wesleyan Methodists were commenced in 1786, when Dr. Thomas Coke, with 3 other missionaries, went to the West Indies. After the death of Wesley, Coke remained at the head of the Wesleyan missions, and crossed the Atlantic for missionary purposes no fewer than 18 times. Within 20 years the number of Methodist missionaries in the West Indies and North America rose to 43. In 1818 Coke embarked with 5 companions for the East Indies, but died before that country was reached. His companions founded a mission in Ceylon, which soon spread to the mainland of India. As long as Coke lived, the administration of foreign missions lay almost exclusively in his hands; but after his death the necessity of a missionary society was felt, which was organized in 1814 at Leeds, and soon became one of the most efficient in the world. Its missions extended in 1859 over Germany, Spain, Ceylon, India, China, S. and W. Africa, and the West

Indies; and they counted 151 circuits, 225 missionaries, 3,937 agents, 63,406 members, 3,271 on trial, 42,788 scholars in Sunday schools, and 180,719 attendants on public worship.—Beside these larger missionary societies, there are a number of smaller ones, as the Welsh Calvinistic Methodist foreign missionary society (founded in 1840), the English Presbyterian church's foreign mission (1844), the Turkish missions aid society, and the New Connection Methodists' foreign mission (commenced in China in 1859).—A "Scotch Missionary Society" was organized at Edinburgh in 1796, and it sent the first missionaries among the Tartars near the Black and Caspian seas. After the suppression of all the Protestant missions in those regions by the Russian government in 1838, the association directed its efforts to western Asia and the West Indies. More recently the society has confined its labors to Jamaica. The established church of Scotland rejected, at its general assembly of 1796, as a folly, a motion to send missionaries among the pagans; but in 1824 a similar motion was entertained and carried. It was not however till 1829 that its first missionary, Dr. Duff, was sent out to Calcutta. In 1843, when a large portion of the ministers and laity left the established church of Scotland, and organized the Free church, all the missionaries joined the latter. The missionary cause greatly gained by this separation, for the established church sent out new missionaries to carry on the work, and both churches henceforth tried to excel each other in zeal.—Among the other societies established by Great Britain and its colonies are: the Glasgow missionary society, in 1796; the United Secession church's foreign mission, 1835; the Glasgow African mission society, 1837; the Irish Presbyterian church's foreign mission, 1840; the Edinburgh medical missionary society, 1841; the Reformed Presbyterian church's foreign mission, 1842; the Loo-Choo naval mission, 1848; the Patagonian mission, 1844; the United Presbyterian church's foreign mission, 1847; the Chinese evangelization society, 1850; and the Chinese society for furthering the gospel, 1850. II. *America*. In the United States attention was early called to the necessity of missionary efforts among the Indians and negroes. The first foreign missionary society was founded under the name of the "American Board of Commissioners for Foreign Missions" in 1810. It owed its origin to a society of students of Andover theological seminary, among whom was Adoniram Judson, whose object was to investigate the best ways and means of making the gospel known to pagan nations. After the model of the London society, they adopted no denominational basis; but the society soon became prominently the organ of the Congregationalists and some of the Presbyterian churches. One of the latter, the Reformed Dutch church, separated a few years ago, and organized a denominational board of foreign missions, which sustains now 3 missions in China and India, and in 1859 sent out mission-

aries to Japan. Its receipts in 1859 were \$25,184. The principal Presbyterian body still in connection with the American board is the New School Presbyterians; but they likewise took steps in 1859 for establishing a closer connection of the Presbyterian missionaries employed by the American board with the Presbyterian church, by the formation of foreign presbyteries. Among the missions of the board, that to the Armenians has been eminently successful, and has already resulted in establishing a native Protestant church in Turkey on a permanent basis. The other missions comprise India, China, S. and W. Africa, the Sandwich islands, and the North American Indians. The entire number of missions in 1859 was 26; of stations, 127, and of outstations, 181; ordained missionaries, 170; whole number of laborers connected with the missions, 896; printing establishments, 5; churches, 153; church members, 23,515; seminaries, 7; number of scholars in seminaries and schools, 8,892; receipts, \$350,915. Mills, Nott, Hall, Schauffler, Winslow, Dwight, Goodell, and others, have been among the distinguished missionaries of this society.—The “American Baptist Missionary Union” was founded in 1814. The principal field of its operations is Indo-China, where the missions among the Karens have excelled in rapidity of growth any other Protestant mission of the world. The Christianization of the whole nation is rapidly advancing, and already Karen missionaries are setting out for the conversion of neighboring tribes. The board in 1859 had under its care 19 missions, 14 of which were in southern Asia, 3 among North American Indians, and 2 in Europe. There were connected with the missions 83 American laborers and about 800 native helpers. The membership of the mission churches amounted to about 22,000, of which over 14,000 were in Asia.—The missionary society of the Methodist Episcopal church was started in 1819. The most numerous missions are in Germany and Liberia; but it has also established missions in China, India, South America, Scandinavia, Bulgaria, and the Sandwich islands. The number of the missionaries in 1859 was 47, and of members 3,748. About the same time (1820) the Protestant Episcopal church organized a board of missions, which employs about 100 laborers under two missionary bishops in W. Africa, China, Greece, Brazil, and Japan. The membership connected with the churches is about 400; the receipts in 1859 were \$99,476.—The board of foreign missions of the Presbyterian church, Old School, founded in 1837, is very active. It had been preceded by a number of smaller societies, some of which had confined their labors to the Indians. It commenced missions in Liberia in 1832, in India in 1833, in China in 1838, among the Chinese in California in 1852, and more recently has sent out missionaries to South America and Japan. Connected with its missions are 78 ordained ministers, 1,158 communicants, and 2,810 scholars.—The Evangelical Lutheran church has

sustained a mission in India since 1841, which in 1859 had 5 missionaries and 86 communicants. The Seventh Day Baptists instituted a foreign mission in 1842, the scenes of whose labors have been western Asia and China, with 3 agents. The southern Baptist foreign mission society, instituted in 1845, has missions in China and W. Africa; the Methodist Episcopal church, South, in China; the United Presbyterians, in western Asia, in Egypt, India, and the islands of the Pacific; the Freewill Baptists and the Unitarians in India. The Cumberland Presbyterians established their first foreign mission in 1860 in Turkey. Some missionary societies have branched off from older associations, on the ground of having no connection with slavery. Such are the “Baptist Free Missionary Society,” organized in 1843, with a mission in Hayti; and the “American Missionary Association,” formed in 1846, and soon joined by the West Indian mission, the western evangelical missionary association, and the Union missionary society, which at once gave to the new society laborers in the West Indies, among the North American Indians, and in W. Africa; its labors have since extended to Siam, the Sandwich islands, and the Copts in Egypt; its receipts in 1859 amounted to \$50,511, and the number of its foreign missionaries to 45. The American and foreign Christian union, established in 1849, directs its efforts mostly to sending out missionaries among the Roman Catholics of America and Europe; its receipts in 1859 were \$73,202.

III. *Continental Europe.* The continent of Europe has remained, in zeal for the missionary cause, far behind England and America. The first country which, at the close of the 18th century, followed the example of the English, was Holland, which formed in 1797, mainly through the influence of Dr. Vanderkemp, a Dutch missionary employed by the London missionary society, the “Netherlands Missionary Society,” at Rotterdam. The political events, in consequence of which Holland lost her colonies, caused a postponement of independent operations until 1819, when they commenced in the Indian archipelago, which is still their chief seat. The missions in India proper, when Holland exchanged with Britain these settlements, were transferred to English societies, but other missions were founded at Surinam, Guiana, and in Curaçoa in the West Indies. The society sustains a seminary at Rotterdam, and counted among its missionaries the celebrated Dr. Gützlaff.—The most extensive of the missionary societies of continental Europe is that of Basel. Unlike the others, it was preceded by the establishment of a missionary seminary, in 1815, which has furnished a number of devoted missionaries to other societies, especially English. An independent society, the “Evangelical Missionary Society of Basel,” was formed in 1821, which now sustains missionaries in North America, W. Africa, India, and China. The income rose, in 1859, from 300,000 to 622,000 francs, and

the entire missionary family, not including the native evangelists and teachers, numbers more than 200 persons; 70 students are under education, and from 80 to 40 children of missionaries are brought up in a separate establishment. The Basel society has received from its foundation the missionary contributions from a number of the German churches. Afterward several other societies sprang up, whose operations, however, have been thus far inferior to those of the English and American societies. Those exclusively or mainly Lutheran are the evangelical Lutheran missionary association of Leipsic, founded in 1836, and occupying in southern India the former missionary field of the Danes; the Berlin missionary society, instituted in 1824, and supporting a mission in S. Africa; and the Hermannsburg society, founded in 1854, which has adopted the plan of sending out entire missionary colonies. Those whose sympathies are with the evangelical party are the Rhenish missionary society, founded in 1828, Gossner's missionary union, in 1836, and the North German missionary society, in 1836, which have missions in Africa, India, China, the Indian archipelago, and the islands of the Pacific. Special associations for China have been formed in Cassel, Berlin, and Pomerania, mostly occasioned by the reports of Dr. Gützlaff; and it was intended to unite them all into a central Chinese missionary association, but this proved unsuccessful. Of late years, the aggregate receipts of the German missionary associations have rapidly risen, as the supreme authorities of nearly all the state churches have strongly recommended them and prescribed the taking up of an annual collection in every church.—France has had a missionary society since 1822, which sustains a flourishing mission in S. Africa, where it has now 18 stations, 14 missionaries, a large band of native assistants, and an income of £4,545.—The Scandinavians have been as yet hardly represented in the foreign missionary field. The Swedes have almost restricted themselves to sending preachers to the Laplanders, and only China has received a few missionaries from a society in Lund. The Norwegian missionary society, established in 1842, has some agents among the Zooloos in S. Africa. But in Scandinavia also, the activity of the missionary societies is increasing. Norway founded a foreign missionary seminary at Bergen in 1859; the second Scandinavian church diet recommended the formation of one great Scandinavian missionary society; and in Denmark, the union of all the local societies into a Danish missionary society was effected in June, 1860.—Having thus given a brief survey of the various missionary associations of the Protestant world, it remains to glance over the various missionary fields to see what has thus far been achieved. In Turkey and Persia, it is especially the Armenians and the smaller oriental denominations that have been penetrated with the principles of Protestantism. Numerous Protestant congregations have been organized among them,

a Protestant literature and periodical publications commenced, and seminaries, colleges, and schools opened. In Persia, Protestantism has exercised a powerful influence on the entire body of the Nestorians. The Greek church has offered to the Protestant missionaries a great resistance; yet among its members a number of missionary schools are in successful operation. Little success has as yet attended the missions among the Mohammedans; but within a few years some conversions to Christianity have taken place, the sale of Bibles and other Christian books has wonderfully increased, and an uncommon interest to become better acquainted with the peculiar doctrines of Christianity has been manifested. In India and Indo-China large accessions to the number of Christians have recently taken place. Indo-China will soon have at least one entirely Christian tribe, the Karens. China has flourishing Protestant communities in Hong Kong and in the five cities, with their environs, which are open to European trade. The membership and influence of these congregations are rapidly increasing, and promise great and speedy success. Japan has been occupied since 1859 by a number of missionaries, but the laws do not as yet allow the conversion of natives. In the Indian archipelago, several islands, especially those owned by the Dutch, have been to some extent brought under the influence of Protestant Christianity. In Africa efforts were made as early as 1752 to evangelize the Copts; the church missionary society founded in 1832 a Coptic school, and in 1838 a seminary for Coptic priests. The influence of the society on the Coptic church has, however, of late decreased; but in Abyssinia the king Theodorus has promised to the missionaries his active coöperation for a Protestant reformation of the church. In Madagascar the introduction of Christianity was patronized by the young and powerful king Radama, who had subjected to himself four fifths of the island; but after his death in 1828 his widow arrested the progress of Christianity by cruel persecution, though it was found impossible to extirpate it. The tribes of southern Africa, which are divided into three principal classes, the Hottentots, Bechuanaas, and Caffres, received the first preaching of Christianity through Moravian missions in 1787, which are still flourishing both among the Hottentots and the Caffres. The missions of the London missionary society spread from the Cape Colony in all directions, and concentrated principally among the Bechuanaas, where especially Moffat distinguished himself. More recently the travels of Livingstone and the efforts of the colonial government of the Cape have greatly increased the prospects of completing the Christianization of S. Africa. In W. Africa the Christianization of the natives, the negroes, is making rapid progress; there also the Moravians were the pioneer missionaries in 1787. The English colony of Sierra Leone (since 1787) and the negro republic of Liberia (since 1822) have come fully under the domin-

ion of Christianity, and are nurseries for native missionaries in the interior of Africa. In the north of America, the Esquimaux of Greenland who live in the dominions of Denmark have been almost completely Christianized. Among those on the coast of Labrador the Moravians have 4 stations with numerous congregations, and they have of late made explorations to establish new gathering places for the poor Indians. The vast area of Hudsonia, or Rupert's Land, though since 1870 under the sway of the Hudson's Bay company, was not opened to Christian missions until 1822, since which time several thousand Christian Indians have been collected into colonies, under the auspices of the church of England. The missionary labors among the Indians in the territory which now constitutes the United States commenced early in the 17th century with Eliot and the Mayhews, and has since engaged the earnest attention of most of the American denominations; yet the majority of the Indians are still pagans, and the number of church members does not amount to more than 12,000. The negro population, on the other hand, is completely under the influence of the Christian church, and comprises at present a church membership of about 500,000. The native population of the West Indies has been fully Christianized, owing especially to the missions of the Moravians, Wesleyans, and Baptists. In the Dutch and English possessions in Guiana the greatest sacrifices of the missionaries have only succeeded in firmly establishing some advanced posts against the paganism of the interior. Australia and Polynesia, in which the mission among the natives was commenced by the London missionary society in 1795, have since been almost wholly converted to Christianity. While the Australian continent has been colonized by Europeans, the islands, and in particular Tahiti, the Feejee and the Sandwich islands, have become Christian states, owing in particular to the American board and the English Wesleyan society. The former in 1859 had 20,231, and the latter 15,186 communicants connected with the native congregations. A number of special missionary societies have been organized for the Christianization of the Jews. These societies together employ about 200 missionaries, and reckon 20,000 converts since the beginning of the 19th century. An observation of the increasing missionary agencies on the one hand, and of the great decline of external hindrances on the other, leaves no doubt that the prospects of the Protestant foreign missions are at present brighter than at any former epoch of church history, and that the formation of a number of new Christian tribes and nations is rapidly approaching.—The literature on the history of the Protestant missions is very copious. Almost every missionary society publishes a periodical, which, together with the annual reports of the societies, is the most trustworthy source of information for the missionary history of a particular denomination or society. The number of works published by

missionaries on special countries is likewise very large. Among the works extending over the whole ground are: W. Brown, "History of the Propagation of Christianity among the Heathen since the Reformation" (2 vols., London, 1814); Huie, "History of Christian Missions from the Reformation to the Present Time" (Edinburgh, 1849); Wiggers, *Geschichte der evangelischen Missionen* (2 vols., 1845-'46); *Handbüchlein der Missions-Geschichte und Missions-Geographie* (Calw, 1844); Newcomb, "Cyclopædia of Missions" (New York, 1860); Aikman, "Cyclopædia of Christian Missions" (London, 1860). A list of all the Protestant missionary societies, together with the statistics of the missionaries, churches, membership, receipts, publications, &c., and a tabular view of the several missionary fields, are given in Scherm's "Ecclesiastical Year Book" for 1859 (New York, 1860).

MISSISSIPPI, one of the S. W. states of the American Union, and the 7th admitted under the federal constitution, situated between lat. 30° 18' and 35° N., and long. 86° 7' and 91° 41' W.; extreme length N. and S., 323 m.; average breadth 143 m., varying from 78 m. below lat. 31° N. to 189 m. on that parallel, and 118 m. on the N. line; area, 47,156 sq. m., or 80,179,840 acres, being 1.61 per cent. of the territorial extent of the United States. It is bounded N. by Tennessee; E. by Alabama; S. between the Alabama line and Pearl river by the gulf of Mexico, and from the Pearl to the Mississippi on the parallel of 31° N. by the state of Louisiana; and W. by Louisiana and Arkansas, having below lat. 31° N. the Pearl river, and above that line the Mississippi, as the dividing lines. The Round, Horn, Ship, Deer, Oat, Pois, and several other islands lying outside of and forming the S. limit of the Mississippi sound, belong to this state. The state is divided into 60 counties, viz.: in the northern district, Attala, Bolivar, Calhoun, Carroll, Chickasaw, Choctaw, Coahoma, De Soto, Itawamba, Lafayette, Lowndes, Marshall, Monroe, Noxubee, Oktibbeha, Panola, Pontotoc, Sunflower, Tallahatchie, Tippah, Tishomingo, Tunica, Winston, Yallobusha; and in the southern district, Adams, Amite, Claiborne, Clark, Copiah, Covington, Franklin, Greene, Hancock, Harrison, Hinds, Holmes, Issaquena, Jackson, Jasper, Jefferson, Jones, Kemper, Landerdale, Lawrence, Leake, Madison, Marion, Neshoba, Newton, Perry, Pike, Rankin, Scott, Simpson, Smith, Warren, Washington, Wayne, Wilkinson, Yazoo. The principal cities and towns are Jackson, the capital, Natchez, Vicksburg, Port Gibson, Biloxi, Mississippi City, Pascagoula, Pass Christian, Handsborough, Paulding, Brookhaven, Summit, Magnolia, Corinth, Grenada, Grand Gulf, Yazoo City, Shieldsborough, Aberdeen, Brandon, Canton, Columbus, Holly Springs, Macon, Oxford, and Woodville.—The population of Mississippi, according to the enumerations made decennially, has been as follows:

| Years | White persons. | Colored persons. | | Total population. | Increase per cent. |
|-----------|----------------|------------------|---------|-------------------|--------------------|
| | | Free. | Slave. | | |
| 1800..... | 5,179 | 158 | 8,489 | 8,850 | ..... |
| 1810..... | 23,094 | 940 | 17,088 | 40,859 | 355.95 |
| 1820..... | 42,176 | 456 | 32,514 | 75,448 | 86.97 |
| 1830..... | 70,448 | 519 | 65,559 | 136,431 | 81.08 |
| 1840..... | 179,074 | 1,866 | 195,211 | 375,651 | 174.96 |
| 1850..... | 295,718 | 980 | 309,878 | 606,326 | 61.46 |

Of the total white population in 1850 (48.76 per cent. of the whole), 156,287 were males, and 139,481 females; of the free colored persons (.015 per cent.), 295 were blacks and 685 mulattoes, and 474 males and 456 females; and of the slaves (51.09 per cent.), 290,148 were blacks and 19,780 mulattoes, and 154,964 males and 154,914 females. Ages: under 1 year, 16,086; 1 and under 5 years, 88,975; 5 and under 10, 94,855; 10 and under 15, 81,780; 15 and under 20, 65,784; 20 and under 30, 110,890; 30 and under 40, 70,927; 40 and under 50, 40,159; 50 and under 60, 20,717; 60 and under 70, 11,121; 70 and under 80, 8,406; 80 and under 90, 994 (slaves 531); 90 and under 100, 238 (slaves 170); 100 and upward, 140 (slaves 120); unknown, 954. Deaf and dumb, 107; blind, 205; insane, 129; idiotic, 222. The white and free colored population (296,648) occupied 51,681 dwellings, and constituted 52,107 families. In the year 1849-'50 there were born 8,687 (2.93 per cent.), married 2,774 (0.93 per cent.), and died 8,374 (1.14 per cent.). The total deaths in the year, including slaves, were 8,721, or 1.44 per cent. of the total population. Of the white and free colored population in 1850 there were born in the United States 291,852, in foreign countries 4,788, and in places not ascertained 506. Of those born in the United States, 140,885 were natives of Mississippi, 84,047 of Alabama, 27,908 of South Carolina, 27,489 of Tennessee, 21,487 of North Carolina, 17,506 of Georgia, 8,357 of Virginia, 3,948 of Kentucky, and 2,557 of Louisiana; and of the foreigners, 2,848 were born in Great Britain and Ireland, 1,151 in Germany, 440 in France, 121 in Italy, and 79 in British America. The employments of the free male population over 15 years of age (75,082) were as follows: in commerce, trade, manufactures, and mechanic arts, 12,053; in agriculture, 50,284; in labor not agricultural, 6,067; in sea and river navigation, 292; in law, medicine, and divinity, 2,829; in other pursuits requiring education, 8,880; in government civil service, 877; in domestic service, 69; and in other occupations, 231. The number employed in manufacturing establishments in 1820 was 650; in 1840, 4,151; and in 1850, 8,173. The number of slaveholders in 1850 was 23,116, viz.: holders of 1 slave, 3,640; of 1 and under 5, 6,228; of 5 and under 10, 5,143; of 10 and under 20, 4,015; of 20 and under 50, 2,964; of 50 and under 100, 910; of 100 and under 200, 189; of 200 and under 300, 18; of 300 and under 500, 8; and of 500 and under 1,000, 1. The federal representative population (all the free and $\frac{3}{4}$ of the slave) was 482,574, and entitled the state to 5 mem-

bers of the house of representatives.—Mississippi has in general an undulating surface, with a general slope toward the S. W. and S. The coast has a shore line on the gulf of Mexico of 88 m., or including the irregularities and islands of 287 m., but has no harbors that admit large vessels. Those of Mississippi City, Shieldsborough, and Biloxi, constituting Ship Island harbor, are the best; and the whole are included in the collection district of Pearl River. About 6 or 8 m. from the shore is a chain of low sandy islands, which form the bay of St. Louis on the west, and Pascagoula, now commonly called Mississippi sound, on the east. These islands produce nothing but pines and coarse grass, and are of but little commercial value, except Ship island, which has a good harbor, and may in the future become a station for ocean steamers. The shores near the mouths of the Pascagoula and Pearl rivers are also low and sandy, and in many places interspersed with marshes. The Mississippi sea coast or shore is for the most part sandy, but productive, elevated above the highest tides, and covered almost to the water's edge with a dense growth of pine, live oak, and magnolia. Where the Pearl and Pascagoula debouche into the sound there are extensive marshes, most of which, it is believed, are susceptible of reclamation. The intervening country, irrigated by numerous tide water streams, is level but dry, producing luxuriant pasturage and a colossal growth of yellow pine. It is one of the healthiest districts in the world. The tract contiguous to the Mississippi river consists of numerous hills very irregularly scattered over the surface, and rising from 50 to 150 feet above the narrow low tract which in some places lines the course of the river. The hills, the base of which is washed by the Mississippi, are called "bluffs," and this region is generally called by this name. It extends from 10 to 25 m. inland, and is of great fertility, being covered with forests of oak, gum, poplar, tulip, ash, maple, and hickory, and a few pine trees. Further E. the country rises imperceptibly higher and extends in wide plains. The numerous water courses which occur on these plains have furrowed their outer edges along the Mississippi, and imparted to them a hilly aspect together with a great degree of fertility. The plains themselves are sandy and covered with the long-leaved pine; but their continuity is interrupted by the bottoms which extend along the affluents of the lower Mississippi, the Pearl, and the Pascagoula, which are several feet lower than the general surface, and from $\frac{1}{2}$ m. to 8 m. wide. These bottoms have a rich and productive soil covered with a fine growth of trees, intermingled in the more elevated parts with lofty canes. The lower parts are mostly cypress swamps. The "bluff" region continues N. to the mouth of the Yazoo, and the furrowed pine plains somewhat further, where they become intersected by rolling prairies, which increase in number and extent further N. and occupy the greatest portion of the country lying

N. of lat. 33°. These prairies where uncultivated are covered with grass during the greatest part of the year, though the country is dry and suffers from want of water. East of this prairie region extends a level but very fertile tract on the upper course of the Tombigbee, which resembles the bottoms in fertility, but is more extensive. In the N. district is a range of hills of moderate elevation, well wooded but devoid of undergrowth, terminating on the Mississippi with what is called the fourth Chickasaw bluff, which extends 10 m. along the river, and is from 60 to 100 feet above its bank. Between these hills and the Walnut hills, with which the southern bluffs terminate in about lat. 32° 30', a distance of more than 170 m., the country is occupied by an immense swamp, produced and fed by the inundations of the Mississippi. Some parts of this low region become dry toward the end of the year, but the others are a permanent swamp. This tract extends to the edges of the prairie region, embracing the Yazoo valley, and is in its widest part (near lat. 34°) about 50 m. wide. As a cultivable country it has no superior, and when drained will be capable of supplying vast amounts of cotton, Indian corn, and other southern staples.—This state, with the exception of the N. E. corner through which the Tennessee river runs, is drained either directly or through the Mississippi river into the gulf of Mexico. The Mississippi forms its W. boundary for more than 500 m. by its windings; but for more than three fourths of this distance, from the N. limit of the state to Vicksburg, the configuration of its banks admits of no port, and below that city the only one of much importance is Natchez. The principal affluents of the Mississippi from this state are the Homochitto, the Big Black, and the Yazoo rivers. The principal constituents of the Yazoo are the Yallobusha and Tallahatchee; and not far from its mouth it receives the Sunflower, that branch of the Mississippi which leaves the main stream S. of the fourth Chickasaw bluff and traverses the great alluvial swamp. Bayou Pierre is another affluent of the Mississippi from this state, and disembogues a few miles below the mouth of Black river. Pearl and Pascagoula rivers are the most important flowing to the gulf. The Pascagoula, which waters the S. E. part of the state, is formed by the junction of the Chickasawha and Leaf rivers, and near its mouth is joined by a tributary, the Escatawpa or Dog river, from Alabama. There are many other streams in all parts of this state, which, though inferior in capacity to those already noticed, are locally important, watering extensive districts and giving fertility to the soil. Nearly all parts indeed are abundantly supplied with running streams.—The state of Mississippi is occupied wholly by deposits of the tertiary and upper secondary formations, which, sweeping around from the southern Atlantic states, attain here their greatest width. Near the gulf of Mexico the sands and clays of the latest periods are spread over the country, and further N. the de-

posits gradually become of greater age. At Vicksburg the eocene appears at the base of the river bluffs, and the upper portion of these is covered by a deep deposit of yellowish loam or loess, containing fresh water and land shells. This extends over the country eastward, and attains a thickness of 60 feet or more. The upper secondary appears near Jackson, and occupies the northern portion of the state. From these formations the only mineral productions the state can furnish are of agricultural interest. The fertility of the soil and a favorable climate give to Mississippi eminent advantages as an agricultural state. There is perhaps no other country in the world that has such alluvial lands as the Mississippi bottom contains—an alluvial plain in a mild climate, level as the surface of the ocean and of inexhaustible fertility; and this plain is only a small part of the fertile lands of the state. The table lands of the north, the loams along the bluffs and banks of the Mississippi, the dark and heavy prairie lands, and the inland bottoms are of scarcely less fertility. The prairies, especially in the Tombigbee district, furnish excellent pasturage. The climate is remarkably equable. Sugar is produced in the south, and cotton forms the great staple of a large part of the state. Wheat and other grains occupy the northern districts. All the fruits of temperate climates grow here in perfection; plums, peaches, and figs are abundant, and in the south the orange. Wild animals, such as the deer, puma, wolf, bear, and wild cat, are still common. Alligators occur in the Mississippi as far N. as the mouth of the Arkansas, and in some of the smaller rivers; and most of the streams abound in fish. Paroquets are seen as far N. as Natchez, and wild turkeys and pigeons abound.—In 1850 Mississippi contained 38,960 farms and plantations, of which 15,110 cultivated cotton to the amount of 5 bales and upward. The total quantity of land in these was 10,490,419 acres, of which 3,444,358 were improved. The cash value of the whole was \$54,738,634; and the value of implements and machinery thereon was \$5,762,927. The live stock owned in the same year consisted of 115,460 horses, 54,547 asses and mules, 214,231 milch cows, 88,485 working oxen, 436,254 other cattle, 304,929 sheep, and 1,582,784 swine, in all valued at \$19,403,662; and the value of animals slaughtered in 1849-'50 was \$3,636,582. The cotton crop amounted to 484,292 bales of 400 lbs. each. The grain crops consisted of 137,990 bushels of wheat, 9,606 of rye, 1,503,288 of oats, 22,446,552 of Indian corn, 228 of barley, 1,121 of buckwheat, and 261,482 of Irish and 4,741,795 of sweet potatoes. The other agricultural products were: hay, 12,504 tons; hops, 473 lbs.; clover seed 84, and other grass seed 538 bushels; peas and beans, 1,072,757 bushels; beeswax and honey, 397,460 lbs.; flaxseed, 26 bushels; flax, 665 lbs.; dew-rotted hemp, 7 tons; cane sugar, 8,000 lbs.; molasses, 18,818 galls.; tobacco,

49,960 lbs.; silk cocoons, 2 lbs.; wine, 407 galls. The value of market garden products was \$46,250, and of orchard products \$50,405. Home-made manufactures were produced to the value of \$1,164,020. The average production to the acre of wheat was 9 bushels, Indian corn 18, oats 12, peas and beans 12, Irish potatoes 105, and of seed cotton 650 lbs. The ratio of the cotton crop to that of the whole country was 19.8 per cent. The total value of the products of agriculture in 1849-'50 was \$36,802,141; in 1840 it was \$26,297,666.—The value of the productions of manufactures and the mechanic arts in 1840 was \$2,879,425, and in 1850, \$2,972,088. In 1850 the total number of establishments was 877, employing a capital of \$1,888,420, and 3,173 hands, viz., 3,065 males and 108 females, using raw material to the value of \$1,290,271, and paying annually in wages \$775,128. Of these, 2 were cotton mills (capital \$38,000) and 8 cast iron works (capital \$100,000). The remainder consisted of mills of various descriptions, tanneries, and mechanic shops, such as are necessary to agricultural states.—Mississippi has but a small share of direct foreign commerce, and in many years none is recorded in the published returns. Its foreign trade is indirect, and almost entirely through New Orleans and Mobile. Cotton and lumber are the chief exports. The amount of shipping held in the state in 1850 was 1,828 (steam 875) tons, and in 1859, 2,690 (steam 676) tons, all of the class "enrolled and licensed," and engaged in the coasting trade. The coasting and river trade is necessarily great, and employs a large tonnage. The coasting trade is chiefly directed to Mobile and New Orleans, while the Mississippi river trade centres in the latter, and that of the Tombigbee in Mobile. The railroads terminating at these two ports are also large carriers of merchandise to and fro, and have tended largely to develop the material interests of the state. The following table shows the extent of the completed portion of the Mississippi system and its cost to the end of 1859:

| Railroads. | Miles. | Cost. |
|---|--------|--------------|
| Grand Gulf and Port Gibson..... | 8 | \$200,000 |
| Memphis and Charleston (part)..... | 97 | 800,000 |
| Mississippi Central..... | 187 | 4,500,000 |
| Mississippi and Tennessee..... | 80 | 1,600,000 |
| Mobile and Ohio..... | 170 | 4,000,000 |
| Columbus branch..... | 14 | |
| N. Orleans, Jackson, and Great Northern | 118 | 3,500,000 |
| Raymond branch..... | 7 | 90,000 |
| Southern Mississippi..... | 83 | 2,500,000 |
| West Feliciana (part)..... | 19 | 850,000 |
| Total..... | 718 | \$17,570,000 |

The uncompleted portion of the system has an equal length of line. The New Orleans, Jackson, and great northern, and the central, form a great N. and S. line through the middle of the state, and the Mobile and Ohio runs in the same direction near the E. boundary, the two lines connecting the systems from the lake and upper Mississippi regions with the southern ports of New Orleans and Mobile; and the Mississippi and Tennessee, branching from the central at Grenada, extends

to Memphis. The Memphis and Charleston crosses the N. E. part of the state transversely; the southern crosses its middle and a line still to be built will cross it near the gulf coast. These will form links in the great chains which will eventually connect the Atlantic and Pacific coasts. The other roads named in the above table are local, but of great advantage to commerce. The length of post route in the state in 1858 was 8,802 m., of which 367 m. was railroad, 677 m. steam navigation, 1,075 m. coach road, and 1,683 m. other road. The telegraph connects the chief places within the state, and the state with all the principal points of the Union.—On Jan. 1, 1860, Mississippi had 2 banks, the condition of which was as follows: Liabilities: capital, \$1,110,600; circulation, \$318; deposits, \$49,875; profits on hand, \$15,821. Resources: notes, bills of exchange, &c., \$394,756; specie, \$591; real estate, \$780,767; total, \$1,176,114.—The government is based on the constitution of 1817 and amendments thereto. The right to vote is enjoyed by every free white male person, 21 years of age, who is a citizen of the United States and has resided in the state for one year and in the town or county for 4 months next preceding an election. The general election is held on the 1st Monday in October, and the legislature meets on the 1st Monday in November biennially (odd years). The senate is composed of 32 members elected for 4 years, and the house of representatives of 92 members elected for 2 years. The governor, who must have been a citizen of the United States for 20 years and a resident of the state for 5 years, is elected for 2 years, and has a salary of \$4,000. The principal administrative officers are the secretary of state (salary \$1,200), the state treasurer (\$1,300), the auditor of public accounts (\$1,500), &c. The judiciary consists of a high court of errors and appeals, circuit courts, justices of the peace, and probate courts. The high court is composed of 3 judges (salary \$3,000), elected from districts, the attorney-general (\$1,200), a clerk (fees), and a reporter; the last is elected by the legislature. The circuit court has original jurisdiction in civil cases in which the sum in controversy exceeds \$50, and exclusive jurisdiction in criminal cases. For each of the circuits, 10 in number, a judge and attorney are elected every 4 years. Each county has a probate court with a judge and a clerk. The probate clerk is also register of deeds. All judicial officers are elected by the people. The revenues of the state are derived chiefly from taxation. For the year ending April 30, 1850, the income from all sources amounted to \$379,402, and the expenditures to \$284,999; for the year ending Oct. 31, 1858, the receipts from all sources were \$682,952, and the expenditures \$614,659. The absolute debt of the state in 1857 amounted to \$2,271,707, and the total debt to \$7,271,707. The annual interest payable on the absolute debt was \$186,000. Against this debt the state owns about \$2,000,000 of unproductive property. The val-

uation of taxable property in 1850 was \$208,422,167, and in 1857 \$462,658,786. Included in 1857 were 868,182 taxable slaves, valued at \$220,990,000. The institutions supported wholly or in part by the state are an asylum for the blind, one for the deaf and dumb, and a lunatic asylum, all at Jackson; also at the same place the state penitentiary, in which were confined on Oct. 31, 1857, 105 convicts, of whom 85 had been admitted during the year. Paupers supported in whole or part within the year ending June 1, 1850, 260, of whom 257 were receiving support at that period; cost yearly, \$18,182. On June 1, 1850, there were in prison 46 convicts, and during the year then ending 51 criminals had been convicted.—There is no uniform common school system. Each township has a school fund, arising from the congressional grant of every 16th section, and there is a distribution from a county fund arising from fines, forfeitures, licenses, &c., to destitute towns. In all the larger towns public schools have been established, and there are also many flourishing high schools. The total number attending school in 1849-'50 was 48,803, or 1 in every 6.06 of the white or in every 12.4 of the total population. Free colored persons are not admitted into the schools. The school statistics for June 1, 1850, as shown by the census of that year, were as follows: 782 primary and public schools, with 826 teachers, 18,746 scholars, and an annual income of \$254,159; 171 academies and private schools, with 297 teachers, 6,628 scholars, and an income of \$26,286; and 11 universities and colleges, with 45 teachers, 862 students, and an income of \$42,400; making a total of 964 schools, 1,168 teachers, 26,236 scholars, and an income of \$322,795. The number of white and free colored persons over 20 years of age who could not read and write was 13,528. The principal collegiate institutions in the state are: Oakland college, Claiborne co., founded in 1830; the university of Mississippi, at Oxford, 1844; Mississippi college, at Clinton, 1851; Madison college, at Sharon, 1852; the law department of the university at Oxford, 1853.—The most numerous religious denominations are the Methodist, Baptist, and Presbyterian. In 1850 the total number of churches in the state was 1,016, with accommodations for 294,104 persons, and as property valued at \$755,542. Of the churches, 385 belonged to the Baptist denomination, 8 to the Christian, 13 to the Episcopal, 454 to the Methodist, 143 to the Presbyterian, and 9 to the Roman Catholic; and 3 were free churches, and 1 union. The total number of newspapers and periodicals published in 1850 was 50, circulating annually 1,752,504 copies; of these, 4 (245,440 copies) were issued tri-weekly, and 46 (1,507,064 copies) weekly; and 10 (circulating 233,480 copies) were literary and miscellaneous, and 40 (1,519,024 copies) political. In the same year there were in the state 117 libraries other than private, and these contained 21,737 volumes; 4 were public libra-

ries with 7,264 vols., 103 school libraries with 3,650 vols., 6 Sunday school libraries with 730 vols., and 4 college libraries with 10,093 vols.—De Soto and his companions were the first Europeans that traversed this region. They made no settlements, however, and the death of the leader in 1542 put an end to the expedition. In 1682 La Salle descended the Mississippi, took formal possession of the adjacent country for the king of France, and called it Louisiana. In 1698 M. d'Iberville was authorized by the French king to colonize the regions of the lower Mississippi. He landed near Ship island, and from this point, setting out with two large barges, he explored the coast, discovered the mouth of the Mississippi, reached the bend at the mouth of Red river, and returning to Ship island erected a fort at the bay of Biloxi, about 80 m. E. from the site of New Orleans. He then embarked for France, leaving the fort in command of his two brothers Sauvolle and Bienville. In Dec. 1699, Iberville returned, and soon after built a fort on the banks of the Mississippi. In 1700 the chevalier de Tonty arrived at Iberville's fort with a party of Canadian French from Illinois. Availing himself of De Tonty's knowledge of the country, Iberville despatched a party under his lead to explore the river and its banks. They ascended to the Natchez country, 400 m. above the French fort, and here selected a site for a fort (which, however, was not erected until 16 years afterward), and called it Rosalie. A settlement was also made in 1703 on the Yazoo river, which was called St. Peter's. The colonies thus planted grew but slowly, and New Orleans, being founded soon after, drew off a large portion of the colonists from the interior, beside attracting the new emigrants; and unfortunately at a later period (1728) ill will grew up between the frontier settlers and the neighboring Indians. The consequence was a conspiracy of the savage tribes for the purpose of exterminating the whites, and in one day every vestige of civilization within the limits of the present state was swept away, and not fewer than 200 persons were killed, and twice that number of women, children, and negroes were made prisoners. The captives, however, were subsequently recovered and the Indians dispersed. A new and stronger fort was also erected at Natchez and supplied with heavy armament; and the French commander, following up his advantages, invaded the Natchez country and returned to New Orleans with 427 of the tribe, among whom were several chiefs, all of whom were soon after sent to St. Domingo and sold into slavery. The colony, though victorious, was much enfeebled by the war, and the destruction of the Indian trade, the main source of its prosperity. But one permanent benefit resulted from this, inasmuch as it induced the "Western Company," which had hitherto monopolized this profitable trade, to surrender its charter, and give to the king an opportunity of conferring on all his subjects equal privileges as to commerce within the

province. The population of the whole country (Louisiana) now exceeded 5,000 souls, of whom 2,000 were slaves, and settlement rapidly extended along the fertile banks of the Mississippi, Red, Arkansas, Washita, and other rivers; and at Natchez settlements had extended along St. Catharine's and Second creeks. Thus situated in 1783, the colony was ready for a new career of prosperity—free from commercial restrictions, with a well organized civil government, and religious instruction amply supplied by the vicar of New Orleans, which at this time belonged to the diocese of Quebec. But these gleams of prosperity were soon obscured by the "Chickasaw war." For a long time the Chickasaw tribe had been hostile to the French, and had incorporated into their nation the refugees of the Natchez when that tribe was broken up. They had completely destroyed the river trade, and kept the colony in constant alarm. Bienville at this conjuncture (1788) returned from France, bearing a commission from the king as governor and commandant-general of Louisiana. His name was once terrible to the savages, but by various combinations they had become strong, and the issue of the war which ensued was adverse to the whites; and at length, after about 10 years' administration of the province, Bienville was superseded by the marquis de Vaudreuil. For the next 10 years the settlements remained free from Indian hostilities, and increased in population and resources; but in 1782 the Chickasaws and Choctaws, encouraged by the English traders, again became hostile, and Vaudreuil determined to invade their country, but accomplished little. After the cession of the eastern part of Louisiana (including what is now Mississippi) to Great Britain in 1763, and until the war of the revolution, immigration into the territory proceeded rapidly. In 1798 the Mississippi territory was created by congress. Its boundaries were the Mississippi river on the W., the 81st parallel on the S., the Chattahoochee on the E., and a line drawn from the mouth of the Yazoo due E. on the N. The territory having been surrendered to the United States as part of Georgia, the consent of that state had been previously obtained to the establishment of a territorial government. This consent was followed several years afterward (1802) by the further cession by Georgia of all her lands S. of Tennessee, and these by an act of congress in 1804 were attached to the Mississippi territory, which thus comprised the whole of what are now the states of Alabama and Mississippi from the 81st to the 86th parallel. The territory below the 81st parallel, and between the Pearl and Perdido rivers, was added in 1811, having been wrested from Spain under the plea that it had originally formed a part of Louisiana. In March, 1817, Alabama was separated from Mississippi and organized under a territorial government of its own; and in December of the same year Mississippi was admitted into the Union as an independent state.

MISSISSIPPI. I. A N. E. co. of Arkansas,

bordering on Missouri on the N., separated on the E. from Tennessee by the Mississippi river, bounded W. by the St. Francis river and Lake St. Francis, and intersected by Little river; area, 1,080 sq. m.; pop. in 1854, 2,266, of whom 541 were slaves. The surface is low and level, and in the drier portions very fertile; and there are a number of lakes, the largest of which is Big lake. In 1854, 192,300 bushels of Indian corn were produced, and in 1850, 200,250 bushels, beside 455 bales of cotton, and 21,278 lbs. of butter. Capital, Osceola. II. A S. E. co. of Mo., bounded N., E., and S. by the Mississippi river, which separates it from Illinois and Kentucky, and drained by James and Cypress bayous; area, 880 sq. m.; pop. in 1856, 4,241, of whom 894 were slaves. The surface is level and the soil very fertile. In 1850 the productions were 354,700 bushels of corn, 3,727 of wheat, 4,985 of oats, and 1,060 lbs. of wool. There were 4 churches, and 190 scholars attending public schools. Capital, Charleston.

MISSISSIPPI RIVER (Indian, *Miche Sopa*, as spelled by some old writers, and interpreted by them the "Great River," and the "Great Father of Waters"), the principal river of North America, and in connection with its main branch, the Missouri, the longest river in the world. The smaller branch, which retains the name of the main lower current, was traced by Nicollet to a small rivulet in the extreme northern portion of the United States, in a region known as the Hauteurs de Terre, 1,680 feet above the level of tide, in lat. 47° 10' N., long. 94° 55' W. From this point the general course of the stream is southward; and as it flows on its long route to the gulf of Mexico, into which it falls in lat. 29° N., it is continually receiving accessions to its current from rivers that flow on the one side from the western slopes of the Alleghanies, and on the other from the eastern slopes of the Rocky mountains. Its total length from its source to the gulf is computed by Nicollet at 2,986 m. But the main branch, the Missouri, the source of which is in the Rocky mountains in lat. 45° N., long. 118° 38' W., is itself 3,096 m. long to its junction with the Mississippi in lat. 38° 50' 50" N., long. 90° 14' 45" W.; and the total length to the mouth of the river at the gulf of Mexico is 4,506 m. The area drained by this system of rivers, all of which unite in one main channel leading to the gulf, includes a large portion of the interior of North America, its limits E. and W. being the mountains respectively near the E. and W. side of the continent, and toward the N. the high lands in which rise the Red river of the North, the Assiniboin, and the Saskatchewan, tributaries of Hudson's bay and the Arctic ocean, and the waters that flow into the lakes of British America. Ellet computes the areas of drainage of the principal branches as follows: of the Missouri, 519,400 sq. m.; Ohio, 202,400; the upper Mississippi, 184,500; the Arkansas, 176,700; Red river, 102,200; and the total area drained by the

Mississippi river above the mouth of the Red river to be 1,226,600 sq. m. The river and its numerous branches, reaching far back into the neighboring states and territories, present a network of navigable waters of vast extent, which, though their capacity of navigation is yet but partially developed, already far exceed in importance to man any other system of rivers upon the globe. The Mississippi is itself ascended by steamboats to the falls of St. Anthony, about 2,200 m.; and above these falls it is again navigable. From the head of the Ohio river at Pittsburg to the gulf of Mexico the distance is 2,413 m. Up the Missouri a steamboat passed in 1859 near to the Great falls at the E. foot of the Rocky mountains, a distance exceeding 3,950 m. from the gulf of Mexico. Arkansas and Red rivers are each navigable for more than 1,000 m.; and the Cumberland and Tennessee afford a water communication between the gulf and the extreme eastern portions of Kentucky and Tennessee. By the Illinois river steamboats penetrate far toward Lake Michigan; and it appears probable from the topography of this region that at some past period the waters of the great lakes flowed in this direction down the valley of the Mississippi. Toward the mouth of the river in Louisiana, the number of branches navigable to greater or less distances is estimated to exceed 1,500. In this state, below the mouth of Red river, the Mississippi is divided among numerous arms or passes, which leave the main channel, and pursue an independent course to the gulf. The highest of these is an important branch on the W. side of the river, called the Atchafalaya. Below its point of separation from the Mississippi the region of swampy lands, of bayous and creeks, is known as the delta. Above this the alluvial plain of the river extends to the Chains, 30 m. above the mouth of the Ohio, where precipitous rocky banks are first met with. These are the lower secondary limestone strata lying in nearly horizontal beds. The total length of the plain from the mouth of the Ohio to the gulf, is estimated at about 500 m. Its breadth at the upper extremity varies from 80 to 50 m.; at Memphis it is about 30 m., and at the mouth of White river 80 m. The extreme width of the delta is rated at 150 m., and its average width is probably 90 m. By the estimate of Mr. Forshey the total area of the alluvial plain is 81,200 sq. m., of which the delta is estimated to cover 14,000 m. According to Prof. Charles Ellet, jr., in his treatise entitled "Inundations of the Delta of the Mississippi" (Philadelphia, 1858), the northern extremity of the delta is elevated 275 feet above the surface of the sea, and is there and everywhere nearly level with low water in the Mississippi river. Its total descent, following the highest surface of the soil, is about 320 feet, or at the rate of 8 inches per mile. It is enclosed on the E. and W. by a line of bluffs of irregular height and extremely irregular direc-

tion, composed of strata of the eocene and later tertiary formations. Down this plain, which the river itself has raised up by the deposit of its sediments from the level of the sea, it flows in a serpentine course, frequently crowding on the hills to the left, and once passing to the opposite side, and washing the base of the western bluff at Helena. In its progress from the mouth of the Ohio to the gulf the actual length of the river is computed at 1,178 m., increasing the distance in a straight line by nearly 700 m., and by its flexures also reducing the rate of its descent to less than half the inclination of the plain down which it flows. When in the low water of the summer and winter the river is depressed, the fall at the head of the plain is about 40 feet, and near New Orleans 20 feet below the top of the banks. The current then flows sluggishly in a trough about 3,000 feet wide, 75 feet deep at the head, and 120 at the foot. The immense curves of the river in its course through the alluvial plain are remarkable features in its topography. They sweep around in half circles, and the river sometimes, after traversing 25 or 30 m., is brought within a mile or less of the place it had before passed. In heavy floods the waters occasionally burst through the tongue of land, and form what is called a "cut-off," which may become a new and permanent channel. The height of the banks and the great depth of the river bed check the frequent formation of these cut-offs, and attempts to produce them artificially have often failed, especially when the soil is a tough blue clay, which is not readily worn away by flowing water. This was the case at Bayou Sara, where in 1845 an excavation intended to turn the river was made, by which a circuit of 25 m. would have been reduced to a cut of one mile. The alluvial tract on each side of the river is for the most part a region of canebrakes, and forests of cypress growing in water. Lakes of semicircular form are scattered over its surface, which are deserted river bends. These are inhabited by alligators, wild fowl, and gar fish, which the steamboats have nearly driven away from the main river. In time of high water from floods, the river overflows its banks and makes its way into these lakes, slowly filling them up with the fine sediment that escapes the filtering action of the canebrakes, and is not deposited with the heavier sediments, which fall along the banks with the slackening of the currents. The low country around is then entirely submerged, and extensive seas spread out on either side, the river itself being marked by the clear broad band of water in the midst of the forests that appear above it. The great freshets usually occur in the spring from the melting of the snows about the sources of the river and its tributaries, and especially when this happens upon several of the great branches at such times that their swollen waters simultaneously enter the main river. These freshets are often attended with very seri-

ous consequences. Crevasses are formed in the banks and increase with the flow, which becomes so violent that flat boats are drawn into them and swept away with their crews into the intricacies of the swamps. At such times it is customary to send canoes to explore and rescue the boatmen who are in danger of being lost. Portions of the plain under cultivation are laid waste; and the planters often find it necessary to join their forces and raise levees along the banks for their protection. It is affirmed that the floods are becoming more frequent and disastrous, and this is ascribed to several causes, such as the diminished evaporation in the country above, as it becomes settled and its drainage improved; the extension of levees along the borders of the river and of its tributaries and outlets, which shut in the waters more and more, preventing their spreading over and losing themselves in the low lands; the cut-offs also cause a more rapid flow of the water, so that it is thrown with greater violence upon the districts below; and lastly, the progression of the delta into the gulf lessens the slope of the river near its mouth, and constantly retards the waters more and more to the damage of the regions above. The plans proposed to correct these evils depend upon state or national legislation for their efficient execution. They are: 1, the construction of higher, stronger, and better levees in lower Louisiana, the effect of which will be to secure the deepest and most capacious outlet; 2, the enlargement of the channel of the Atchafalaya, and making it an independent outlet for the waters of the Red river and the Washita; the enlargement of the Bayou Plaquemine will also afford some relief to the country below; 3, the prevention of additional cut-offs in the upper portions of the river and its branches; 4, the formation of an outlet of the greatest possible capacity from the Mississippi to the head of Lake Borgne, with the view of converting this ultimately into the main channel of the river; 5, it is recommended to form extensive reservoirs on the distant tributaries by placing dams across them, with apertures sufficient for their uniform discharge, so as to retain a portion of the water till the floods have subsided below; by this means the loss of the natural reservoirs destroyed by the levees would be in part compensated, the navigation of the tributaries be improved, and the violence of the floods below be proportionally abated.—The lower portion of the alluvial plain, called the delta, rises from a few inches to 10 feet only above the level of the sea, and is formed of sands and clays deposited in horizontal layers. In the steep banks of the Atchafalaya are noticed alternate beds of bluish clay, such as is brought down by the Mississippi, and of red ochreous earth, a deposit peculiar to the Red river, proving, as observed by Darby in his description of Louisiana, that at the period when these deposits were made the two rivers flowed alternately over this region. No distinction of this sort is

now observed in the sediments, as they are thoroughly mixed together below the junction of the two rivers before they are deposited. The delta protrudes far out into the gulf of Mexico beyond the general coast line, and is slowly but imperceptibly advancing into the gulf by the shoaling caused by the deposition of the sediment brought down the river. This is mostly dispersed by the waves and currents, and carried far out into the gulf. For although the banks of the passes are sometimes observed to have advanced in the course of a few years sensibly into the gulf, these are but narrow strips of land, which may be swept away by the rush of the gulf waters driven up by storms; and the long coast of the delta in the same time has experienced no perceptible change. It is remarkable that, in this region of shifting sands and sediments, the old French maps of the early part of the last century should still very correctly represent many of the mud banks and channels or bayous around the Baliza, which is the station of the pilots at the mouth of the river. Here only, for a distance of 100 m. from the gulf, is the river seriously obstructed by bars, which impede the passage of large vessels. Over these the depth of water is sometimes only 15 feet; but this is very changeable, as the channels are shifted by the floods in the river and the gulf storms. These bars are composed of blue clay mud, through which vessels drawing 2 or 3 feet more water than the actual depth can be taken by steam tugs. Great efforts have been made to remove these obstructions by dredging; but the attempt is now given up as hopeless, as it is found that in a single flood the channel may be quite filled up again. It has also been attempted to deepen the channel on the S.W. pass, which is the principal entrance of the river, by means of piles so driven as to confine the current within a limited width, and thus cause it to excavate its channel more deeply. This failed for the reason that the flow was directed more forcibly than before through other channels that remained open, and the effect was to deepen the pass known as *À l'Outre*, which, for a time, afforded a better passage for vessels than the S.W. pass.—The sediment with which the lower Mississippi is charged is chiefly a fine clayey matter, so universally suspended in the water as to give it a thick muddy appearance. The upper Mississippi is a clear stream, but the Missouri pours into it a vast amount of whitish muddy matter, which renders the water so turbid, that at St. Louis one cannot see through a tumbler filled with it. This, however, does not prevent its being generally used for drinking, and for culinary purposes; indeed, it is commonly preferred to any other water. The Ohio adds to it a current of greenish color; and the Arkansas and Red rivers pour in the red ochreous sediment already referred to; while the Mississippi itself excavates its alluvial plain and sweeps down, intermingled with the rest, vast quantities of vegetable soil

that falls in the banks of the river. The coarser pebbles and sands accumulate in the bends and eddies, forming bars, and the lighter materials are carried on to be deposited in the gulf of Mexico. Sir Charles Lyell, when he visited New Orleans in 1846, making use of the results of the observations of Dr. Riddell, Dr. Carpenter, and Mr. Forshey, attempted to estimate the annual discharge of sediment and of water, and the time that has probably been expended in the production of the delta. The mean annual amount of solid matter was found to be $\frac{1}{111}$ the weight of the water, or about $\frac{1}{33}$ the volume of the water. Adopting the average width, depth, and velocity, as given by these gentlemen, Lyell assumed 528 feet or $\frac{1}{4}$ of a mile as the probable thickness of the deposit of mud and sand in the delta; founding this conjecture on the depth of water in the gulf between the southern point of Florida and the Balize,* and partly on borings 600 feet deep, all in alluvial matter, in the delta near Lake Pontchartrain, N. of New Orleans. "The area of the delta being about 13,600 square statute miles, and the quantity of solid matter annually brought down by the river 3,702,758,400 cubic feet, it must have taken 67,000 years for the formation of the whole." In this estimate no allowance is made for the loss of fine sediment swept out into the gulf, nor does it include the deposits of the alluvial plain above the delta, which, allowing its depth to be 264 feet, and its area only equal that of the delta, would have required 88,500 years more for its accumulation. Mr. Forshey, in a publication made in 1850, presenting the results of observations extending through a period of 80 years, gives the average discharge of water for the year at Carrollton, 9 m. above New Orleans, as 447,199 cubic feet per second. By this estimate, Lyell observes, the number of years required to accomplish the result above alluded to would be reduced one eleventh. Mr. Forshey concluded that the cubic contents annually brought down equal 4,083,838,883 feet, enough to cover 12 miles square one foot deep. In 1851 and 1852, Mr. Forshey found the mean discharge continued through these years equal to 610,050 cubic feet per second; and the high water discharge equal to 1,059,925 cubic feet, the latter not including, of course, what escaped by the crevasse outlets below Red river. In the work of Prof. Ellet the total flow, including that of the Atchafalaya, in the flood of 1850, is referred to as 1,280,000 cubic feet per second. The discharge below New Orleans at the top of the flood of 1851 was 995,000 cubic feet per second, and at Memphis in 1850, 958,500 cubic feet. At the same time higher up the river the flow was much greater, being in June, 1851, one mile below the mouth of the Ohio, 1,228,-

000 feet, although the flood was 7 feet 10 inches below the high water of 1850; and in July, 1851, at Cape Girardeau, above the mouth of the Ohio, when the river was 4 feet below the high water of 1850, it was 1,025,000 cubic feet per second. This does not include the water which overflows the banks, and is lost in the swamps. The amount thus lost in the swamps of Missouri and northern Arkansas is estimated at 40 per cent. of the whole volume. The average flow of the river at Memphis, Tenn., was estimated in 1850 by R. A. Marr, U. S. N., to be 484,711 cubic feet per second—the amount in March varying per day from 46,188,127,880 cubic feet to 88,827,520,040, the river being 76 to 88 feet deep; and in October from 10,708,228,080 cubic feet to 16,892,279,100, the depth varying from 52.2 to 56 feet. According to this, the average flow is less than that given of the Ganges, which is 580,000 cubic feet per second.—The uniformity of width of the Mississippi river is very remarkable. At New Orleans it is somewhat less than half a mile wide, and from this it varies little for a distance of nearly 2,000 m., except that in the bends it swells out to $1\frac{1}{4}$ or even 2 m. The junction of its principal branches produces no increase in the width, the maximum being attained before their entrance into the main river. Even when the Missouri, which is half a mile wide, joins its current to that of the Mississippi, the river below is of rather less width than that of either one above. The depth is very variable, sometimes reaching 188 feet, but the maximum is more commonly from 120 to 180 feet. The mean depth at high water mark is about the same at Carrollton and at Natchez, 800 m. further up. A section of the river at Carrollton, made at high water mark in 1849, comprises 168,226 square feet, and at Natchez 167,000 feet. The mean rate of descent for the first 100 m. above the mouth is 1.8 inches per mile; for the 2d 100 m., 2 inches; for the 3d, 2.3 inches; and for the 4th, 2.57 inches. The velocity of flow of the whole body of the river is variously estimated. Mr. Forshey makes the mean velocity at the surface, when the water is at a mean height, to exceed $2\frac{1}{4}$ m. an hour. It varies at Carrollton from 1.45 m. per hour at low water, to 2.61 m. at high water. Prof. Ellet remarks that the mean velocity at the surface is 2 per cent. less than the velocity below the surface to near the bottom, the retardation at the top being caused by contact with the atmosphere.—The mouth of the river being some 1,400 m. nearer the equator than the source, and consequently about $2\frac{1}{4}$ m. further from the centre of the earth, a curious question has been raised, which has excited some discussion: whether the river does not actually run from a lower to a higher level. The apparent paradox is explained by reference to the centrifugal motion of the earth, which causes the true horizontal level upon a large scale to be the earth's surface of equilibrium. It is the centrifugal motion of the earth that sus-

* The depth of 100 fathoms, given by Lyell, is probably far short of the actual average depth of the gulf. Within 10 m. of the mouth of the Mississippi it has been found to exceed 14,000 feet, and thence toward the Tortugas soundings have been made of 11,300 feet, or about $2\frac{1}{2}$ m., without finding bottom.

tains the oceanic waters in the equatorial regions at greater distances from the centre than the level of the same waters in the temperate and polar latitudes; and if this motion were checked, the waters would then rush toward the poles, and the current of the Mississippi would be reversed.—The Mississippi, like the other great rivers of the West, is continually gathering into its current numbers of trees that fall into the stream, as the banks upon which they grew are undermined. Swept along by the great floods, they are frequently left in the main channels, their roots fixed to the bottom, and their tops, in part or entirely submerged, pointing down stream and swaying up and down from the motion of the current. In this condition they are known as snags and sawyers, and are greatly dreaded as presenting to boats ascending the river, especially at night, a most dangerous obstruction. To guard against their sinking the boats, these were formerly constructed with a water-tight compartment, called the snag chamber, in the bow, which, if pierced, might fill with water without endangering the boat. The navigation is now greatly improved by the continual care given to the removal of these obstructions; for which purpose, boats, called snag boats, provided with powerful machines for raising and drawing them away from the channels, are specially employed. The accumulations of the drift materials in the arms of the river have sometimes been so great as to completely bridge these over and extend for miles up the current. The obstruction is then known by the name of raft. From about the year 1778 such an accumulation had been gathering in the Atahafalaya, until in 1816 it had extended to full 10 m. in length, over 600 feet in width, and about 8 feet in depth. Though rising and falling with the water, it afforded a soil for the growth of bushes and of trees, some of which reached the height of 60 feet. In 1835 the state of Louisiana took measures to have it removed, and this was finally accomplished at a heavy cost in the course of 4 years. The Red river raft is still more famous for the large sums which have been appropriated by congress to effect its removal. The delta contains among its beds of clay and sand a vast number of ancient trunks of trees brought down and deposited by the river in distant periods of its history; and the soil also contains numerous trunks standing erect as if they had originally grown in these positions, and the surface had subsided with them to lower levels.—The first European explorer of the Mississippi valley was De Soto, who with his party reached the river in June, 1541, as is supposed not far below the site of Helena in Arkansas. (See Dr Soto.) In 1678 Marquette and Joliet descended the river to within 8 days' journey of its mouth. La Salle, in 1682, descended the river to the gulf of Mexico, and took possession of the country in the name of the king of France. About the year 1699 Iberville built a fort upon the banks

of the river, and in 1708 the settlement of St. Peter's was made upon the Yazoo branch. New Orleans was laid out in 1718, and levees were immediately commenced, which were completed in front of the city 10 years afterward. At that time the levee system of lower Louisiana was fully established.

MISSOLOGHI, or MISSOLOGHI, a town of Greece, capital of the diocese of Ætolia, 24 m. W. from Lepanto, on the N. side of the gulf of Patras. It stands in a perfectly level plain 18 m. in length and 4 in breadth, watered by the Achelous and Evenus, and extending from the base of Mt. Aracynthus to the gulf. The walls are washed by the sea, but the water is so shallow that nothing larger than a small fishing boat can approach nearer than 4 or 5 miles. It is famous for the sieges it has sustained. In 1804 the town, which then contained 4,000 inhabitants, fell under the dominion of Ali Pasha. In 1821 it joined in the revolt of the Greeks against the Turks, and on Nov. 5 the Greek commander-in-chief, Prince Mavrocordato, and the famous partisan Marco Bozzaris, threw themselves with 400 men into the place, which was then almost deserted and scarcely defensible, the fortifications consisting only of a low and ruinous wall, without bastions, and a small ditch in many places filled with rubbish. With no artillery but 14 old guns and scanty ammunition, Mavrocordato made a brilliant defence for more than two months against a Turkish army 14,000 strong, commanded by Omer Vrione, the most experienced of the Ottoman generals. On Nov. 28 the Greeks succeeded in throwing in reinforcements by sea, and the Turks were compelled to raise the siege, Jan. 6, 1823. The town was then fortified under the direction of English officers, at the expense of an Englishman named Murray, and was made one of the strongest places in Greece. In Sept., Oct., and Dec., 1823, Missolonghi was again besieged for 59 days by the Turks, and defended by Constantine Bozzaris, until it was relieved by Mavrocordato. Lord Byron came to Missolonghi in Jan. 1824, as a volunteer in the Greek cause, and died there, April 19. The last and greatest siege of Missolonghi, which occupied the attention of the civilized world for more than a year, began in April, 1825, when Reshid Pasha invested it with a large army, which was reinforced in July by the arrival of the capudan pasha with a powerful fleet, and in Jan. 1826, by Ibrahim Pasha with an army of 20,000 Egyptians. The garrison of 5,000 Greeks, commanded by Noto Bozzaris, made a most gallant and desperate defence, repulsing repeated assaults, and, though suffering terribly from want of provisions, refusing to capitulate, notwithstanding repeated offers of the most favorable terms. At length, when continual bombardment had reduced the town to a heap of ruins and the last of their food had been consumed, at midnight of April 22, 1826, the garrison, placing the women in the centre, sallied forth in a body, and cutting their way through

the Turkish camp gained the shelter of the mountains, to the number of about 2,000. Those who were too feeble from hunger or from wounds to join in the sortie, assembled in a large mill which was used as a powder magazine, and when the Turks entered the town blew themselves up together with a large number of the enemy.

MISSOURI, one of the N. W. states of the American Union, and the 11th admitted under the federal constitution, situated between lat. 36° 30' and 40° 30' N., and long. 89° 2' and 95° 52' W.; length N. and S. 277 m.; average breadth about 244 m., varying from 200 m. in the N. to 312 m. in the S., and a narrow strip between the St. François and Mississippi rivers extending beyond the general body of the state $\frac{1}{2}$ ° southward into Arkansas; area, 67,880 sq. m., or 48,128,200 acres, being 2.29 per cent. of the total territory of the United States. Missouri is bounded N. by Iowa; E. by Illinois, Kentucky, and Tennessee, from which the Mississippi river divides it; S. by Arkansas; and W. by the Indian, Kansas, and Nebraska territories, from which it is divided by a N. and S. line on the meridian of the mouth of Kansas river, and thence N. by the main channel of the Missouri river. The state is divided into 112 counties, viz.: Adair, Andrew, Atchison, Audrain, Barry, Barton, Bates, Benton, Bollinger, Boone, Buchanan, Butler, Caldwell, Callaway, Camden, Cape Girardeau, Carroll, Cass, Cedar, Chariton, Clark, Clay, Clinton, Cole, Cooper, Crawford, Dade, Dallas, Daviess, De Kalb, Dent, Dodge, Douglas, Dunklin, Franklin, Gasconade, Gentry, Greene, Grundy, Harrison, Henry, Hickory, Holt, Howard, Howell, Iron, Jackson, Jasper, Jefferson, Johnson, Knox, La Cade, Lafayette, Lawrence, Lewis, Lincoln, Linn, Livingston, McDonald, Macon, Madison, Maries, Marion, Mercer, Miller, Mississippi, Moniteau, Monroe, Montgomery, Morgan, New Madrid, Newton, Montoway, Oregon, Osage, Ozark, Pemiscot, Perry, Pettis, Phelps, Pike, Platte, Polk, Pulaski, Putnam, Ralls, Randolph, Ray, Reynolds, Ripley, St. Charles, St. Clair, St. François, Ste. Genevieve, St. Louis, Saline, Schuyler, Scotland, Scott, Shannon, Shelby, Stoddard, Stone, Sullivan, Taney, Texas, Vernon, Warren, Washington, Wayne, Webster, Wright. The principal towns and cities are Jefferson City, the capital, St. Louis, Booneville, Cape Girardeau, Hannibal, Independence, Lexington, St. Joseph, and Kansas City.—The population of Missouri, according to the federal enumerations taken decennially, has been as follows:

| Years. | White. | Free colored. | Slaves. | Total population. | Increase per cent. |
|-----------|---------|---------------|---------|-------------------|--------------------|
| 1810..... | 17,297 | 607 | 2,611 | 20,515 | ..... |
| 1820..... | 55,983 | 876 | 10,322 | 67,181 | 219.43 |
| 1830..... | 114,793 | 569 | 25,091 | 140,453 | 110.94 |
| 1840..... | 233,888 | 1,674 | 68,246 | 293,808 | 178.18 |
| 1850..... | 592,064 | 2,618 | 87,422 | 682,104 | 77.76 |

The following censuses have been taken quadrennially under state authority:

| Years. | White. | Free colored. | Slaves. | Total. |
|-----------|---------|---------------|---------|---------|
| 1848..... | 510,435 | 1,779 | 76,757 | 588,971 |
| 1852..... | 684,984 | 2,526 | 87,307 | 794,817 |
| 1856..... | 806,744 | 2,652 | 101,805 | 911,201 |

Density of population in 1850, 10.12 to the square mile; ratio to the total population of the Union, 2.94 per cent. The density in 1856 was 18.52 to the square mile. Of the white population in 1850 (86.80 per cent.), 812,987 were males and 279,017 females; of the free colored (0.88 per cent.), 1,361 males and 1,257 females; and of the slaves (12.82 per cent.), 43,484 males and 43,938 females. Of the free colored, 687 were blacks and 981 mulattoes; of the slaves, 74,187 blacks and 18,335 mulattoes. The white and free colored inhabited 96,849 dwellings, and constituted 100,890 families. Births (white and free colored) in 1849-'50, 19,682 (3.80 per cent.); marriages, 6,989 (1.17 per cent.); deaths, 10,987 (1.60 per cent.), and including slaves, 12,292 (1.80 per cent.). Deaf and dumb, 282; blind, 232; insane, 262; idiotic, 357. Of the white and free colored population (594,622) there were born in the United States 520,826 (87.59 per cent.); in foreign countries, 72,474 (12.19 per cent.); and in unknown parts, 1,322 (0.22 per cent.). Of the native-born, Missouri supplied 277,604, Kentucky 69,694, Tennessee 44,970, Virginia 40,777, North Carolina 17,009, Indiana 12,752, Ohio 12,787, Illinois 10,917, Pennsylvania 8,291, New York 5,040, Maryland 4,258, South Carolina 2,919, Arkansas 2,120, Alabama 2,067, Iowa 1,866, Georgia 1,254, and Massachusetts 1,103. Of the foreign-born, there were from the United Kingdom 21,338 (Ireland 14,784), British America 1,053, France 2,188, and Germany 45,190. Ages of the total population: under 1 year, 22,831; 1 and under 5 years, 98,947; 5 and under 10, 105,176; 10 and under 15, 92,844; 15 and under 20, 75,587; 20 and under 30, 125,384; 30 and under 40, 80,872; 40 and under 50, 47,054; 50 and under 60, 24,702; 60 and under 70, 10,705; 70 and under 80, 3,369; 80 and under 90, 831; 90 and under 100, 142; 100 and upward, 45; unknown, 155. The occupations of 128,175 free male persons over 15 years of age in 1850 were as follows: commerce, trade, manufactures, mechanic arts, and mining, 30,098; agriculture, 65,561; labor not agricultural, 20,326; army, 805; sea and river navigation, 2,471; law, medicine, and divinity, 2,893; other pursuits requiring education, 3,147; government civil service, 767; domestic service, 1,458; other pursuits, 1,149. The number employed in manufacturing establishments in 1820 was 1,952; in 1840, 11,100; and in 1850, 16,850. The number of slaveholders in 1850 was 19,185, viz.: holders of 1 slave, 5,762; of 1 and under 5, 6,878; of 5 and under 10, 4,370; of 10 and under 20, 1,810; of 20 and under 50, 545; of 50 and under 100, 19; and between 200 and 800, 1. The federal representative population of Missouri in 1850 was 647,075, and entitled the state to 7 members of congress.—The Mis-

souri river divides this state into two distinct parts, each marked by a different configuration. The S. part consists of an undulating country, rising into mountains as it approaches the Ozark range. That portion N. of the river is more level, but sufficiently diversified to permit of drainage. Looking at these districts more in detail, and beginning with the extreme S. E., we find an extensive bottom land along the Mississippi, commencing on the N. at Cape Girardeau and extending S. to the Arkansas river. It includes many swamps which are rendered almost impenetrable by a dense growth of trees, mostly cypress. The most extensive of these, called the Great swamp, commences a few miles S. of Cape Girardeau and passes S. to the mouth of the St. François, penetrating far into the state of Arkansas. More than 100 m. of this swamp are in Missouri. Within the bottom are also many lakes and lagoons; but it likewise contains many islands elevated above the reach of the highest floods. Since the earthquakes of 1811-'12 much of this tract has been inundated and uncultivated; but it is capable of being reclaimed, and has a very fertile soil. The highlands along the Mississippi begin a little below Cape Girardeau, and extend up to the mouth of the Missouri river. The highest part is that between Ste. Genevieve and the Maramec river, where the banks of the river, composed of solid masses of limestone, rise occasionally 360 feet above the water. This highland and undulating country extends westwardly across the entire breadth of the state, its rugged character however disappearing as the Osage river is approached. This is one of the least populous sections of the state, but it is one of the most picturesque and interesting in the world. It has a mild, dry, and genial climate. Between the Gasconade and Osage, both of which are affluents of the Missouri, a range of low hills approaches that river, rising from 150 to 200 feet above its mean level. They are thinly wooded, and constitute the northernmost offset of the Ozark mountains, a region of which the undulating country on the E. may be considered as the lowest portion. This elevated tract covers more than half of that portion of the state S. of the Missouri. The surface is extremely broken and hilly; the hills, which rise from 500 to more than 1,000 feet above their bases, are exceedingly numerous, but do not form continuous ranges, being divided into knobs and peaks with rounded summits, and presenting perpendicular cliffs and abrupt precipices of sandstone. The soil covering them is generally shallow, and overgrown almost exclusively with pitch pine, cedar, and bramble. Along the numerous rivers which originate in this tract are bottoms of moderate extent and tolerable fertility, but they are subject to heavy floods. To the W. of this region, the country, especially the basin of the Osage, is chiefly a rolling prairie, diversified with forests of stunted timber; and to the N., along both sides of the Missouri, extends a rich alluvial bottom

which is probably more fertile and better settled than any other district, with the exception of the country about the confluence of the river with the Mississippi. A large part of this prolific region is still, however, in a state of nature, and covered with a deep and heavy growth of timber. In the country N. of the Missouri, which comprehends about one third of the state, the surface is generally rolling or level. The bottoms along the Missouri and Mississippi are remarkably fertile. Between these two large rivers the country is much diversified by the broad valleys of their subsidiary streams, and intervening tracts of undulating upland which are united with the valleys by gentle slopes. The woodlands occur only on the margins of the water courses, and the uplands are extensive prairies completely destitute of a timber growth. These prairies occupy at least nine tenths of the whole region, and comprehend some of the best lands of the state.—The great rivers of Missouri are the Mississippi, which washes the E. boundary for 470 m., and the Missouri, which, after forming a large part of the W. boundary, crosses the state in a direction E. by S. to its junction with the Mississippi. Among their affluents are the White and St. François rivers, which drain large sections in the S. part of this state, but are properly rivers of Arkansas. The Maramec, which enters the Mississippi 20 m. below St. Louis, has a course not exceeding 180 m. Salt river, which joins the Mississippi 65 m. above the confluence of the Missouri, runs for more than 200 m. with a gentle course through a tolerably fertile bottom land. There are other considerable streams flowing into the Mississippi both above and below the Salt, which afford extensive mill power. Of the affluents of the Missouri from this state the most considerable are the Osage and Gasconade. The Gasconade is important chiefly for the supplies of timber which it furnishes, and also for its vast water power for manufacturing purposes; its length is about 120 m. The Osage rises in the plains between the Arkansas and Kansas rivers, and flows in a general E. N. E. direction about 400 m., joining the Missouri near the centre of the state; it is 375 yards wide at its mouth, and is navigable for light draught steamboats through half its course. The Chariton, Grand, Platte, and Nodaway rivers are affluents from the N., and each is navigable for some distance. The Grand spreads out into numerous branches, and drains a large section of the middle prairies.—The range of the geological formations of Missouri is almost limited to those groups which are comprised between the lower silurian rocks and the upper coal measures. The drift formation is spread over the northern portion of the state, the river bottoms are formed of alluvium, and beds of clay and marl, called the bluff loess, of an age intermediate between the drift and alluvium, cap the river hills. In the southern and central portion of the state ridges of porphyritic rocks are traced in an E. and W. direction, and among these and at their contact with the silu-

rian limestones occur important deposits of iron ores and other metallic productions. The upper and middle portions of the coal measures attain together a thickness of 500 feet, and are spread over the N. W. part of the state, being a continuation of the coal formation of Iowa. The coal beds are few and small, and the coal is of highly bituminous character. The lower portion of the coal formation, measuring about 140 feet in thickness, is more productive in coal, and is worked in St. Louis co. It is thence traced westward across the state in most of the counties lying near the Missouri river on the S. side. Below the coal measures the formations are mostly of calcareous character, some of which are identified with those of the eastern states. They are named as follows by Prof. G. O. Swallow, the state geologist. The carboniferous limestone is subdivided into 4 members, viz., ferruginous sandstone, 195 feet thick; St. Louis limestone, 250 feet; Archimedes limestone, 200 feet; and the lowest, encrinital limestone, 500 feet. The devonian series is represented by the Chouteau limestone, vermicular sandstone and shales, lithographic limestone, Hamilton group, and Onondaga limestone, the total thickness amounting to about 380 feet; the upper silurian by the delthyris shaly limestone, 175 feet, and the Cape Girardeau limestone, 45 feet thick; the lower silurian by the Hudson river group, 120 feet, Trenton limestone, 860 feet, and alternating formations, 4 of magnesian limestone, and 8 of sandstone, the aggregate thickness of which is over 1,100 feet, the 8 sandstone formations making of this only about 250 feet. These groups are above the Potsdam sandstone, the occurrence of which has not been observed in the state. The 8d magnesian limestone is eminently the lead-bearing rock, but many mines are also worked in the 9d or next upper limestone. Hematite iron ores abound in these calcareous formations. The sandstones afford excellent sand for the manufacture of glass. The stratified rocks throughout the state lie in a nearly horizontal position, and their undulations are everywhere gentle. Even where they meet the azoic formations, as the porphyries of the Iron mountain and Pilot Knob range, they are not disturbed in their position. For further notice of the mineral productions of Missouri, reference may be made to the articles COAL, COBALT, COPPER, IRON, IRON MOUNTAIN, and LEAD.—The climate of Missouri is in some respects extreme. The winters are sometimes long and severe, the summers often hot; but sudden and frequent changes of temperature occur. The mean annual temperature at Jefferson Barracks (lat. 38° 28', elevation 472 feet) for 26 years was 55.46°, distributed to the seasons thus: spring, 56.15°; summer, 76.19°; autumn, 55.68°; winter, 38.85°. The lowest monthly mean in this period was 18.54°, and the highest 85.80°. The annual rain fall is 37.88 inches, distributed as follows: spring, 10.56 inches; summer, 12.88; autumn, 8.02; winter, 6.37.—

The soils in most of the uplands are formed by the disintegration of sandstones and limestones. The arenaceous soils of the rolling prairies of the north are often very fertile; and so also are the soils formed from the decomposition of the carboniferous limestones, especially in the vicinity of the streams. In the S. districts along the river bottoms, where clay abounds, an excellent soil is found. Maize, wheat, oats, and tobacco appear at the present time to form the staple productions of the state. Cotton was formerly grown in the southern counties, but its culture is now abandoned, and hemp and flax have taken its place. The peach, nectarine, apple, and pear are cultivated, and the wild grape abounds. The Catawba and other improved varieties of grape are extensively cultivated in several counties, and large quantities of wine are annually produced. The prairies form excellent pasture lands, and the bottoms furnish canes and rushes for winter fodder. Sheep farming is also successfully and extensively pursued, and swine are very numerous, being readily raised in the forests. Elk and deer are still met with in herds on the prairies W. of the Ozark mountains, and many fur-bearing animals in the unsettled parts, but in too small numbers to be profitable to the hunter.—The number of farms and plantations in Missouri in 1850 was 54,458, occupying 9,732,870 acres of land, 2,988,425 acres of which were improved; and the whole was valued at \$68,225,549. The value of implements and machinery was \$3,981,525. The live stock in the same year consisted of 225,819 horses, 41,667 asses and mules, 280,169 milch cows, 112,168 working oxen, 449,178 other cattle, 762,511 sheep, and 1,702,625 swine; value of live stock, \$19,887,580; value of animals slaughtered in 1849-'50, \$3,867,106. Products of animals: butter, 7,834,359 lbs.; cheese, 203,572; wool, 1,627,164. The crops of 1849 were as follows: wheat, 2,961,652 bushels; rye, 44,268; oats, 5,278,079; Indian corn, 86,214,537; barley, 9,681; buckwheat, 23,641; Irish potatoes, 989,006; sweet potatoes, 885,505; hay, 116,925 tons; hops, 4,180 lbs.; clover seed, 619, and other grass seed, 4,846 bushels; peas and beans, 46,017 bushels; beeswax and honey, 1,328,972 lbs.; flax seed, 13,696 bushels; flax, 627,160 lbs.; hemp, dew-rotted, 15,968, and water-rotted, 60 tons (45.96 per cent. of the whole product of the Union); maple sugar, 178,910 lbs.; molasses, 5,636 galls.; rough rice, 700 lbs.; tobacco, 17,113,784 lbs.; silk cocoons, 136 lbs.; wine, 10,568 galls. The value of the produce of market gardens was \$99,454, and of orchards \$514,711. Value of home manufactures, \$1,674,705. The total value of the agricultural products of the state in 1840 was \$9,755,615, and in 1850 \$34,619,640. The average production to the acre in Missouri is: wheat, 11 bushels; Indian corn, 34; oats, 26; Irish potatoes, 110; tobacco, 775 lbs.; hay, 1½ tons; dew-rotted hemp, 775 lbs.—The statistics of the manufactures, &c., of the state in 1850 were as follows: establishments, 3,029;

capital, \$3,079,005; raw material used, \$12,446,738; hands, 15,977 males and 873 females; annual wages, \$3,184,764; product of the year, \$33,749,265. Among the manufactories are noted 2 cotton mills, capital \$102,000; 1 woollen mill, \$20,000; 5 pig iron works, \$619,000; 6 cast iron works, \$187,000; 2 wrought iron works, \$42,100; 22 distilleries and breweries, \$298,900. The total value of manufactures produced in the state in 1840 was only \$5,946,759, showing an increase in 10 years of \$17,802,506, or about 800 per cent.—Missouri had in 1854 about 400 direct importers of foreign goods. Its domestic trade is immense; centring at St. Louis, the commercial depot of the upper section of the great valley, it extends in every direction. Its steamboats are found at New Orleans and St. Paul; at Pittsburg, Cincinnati, and Louisville on the Ohio river; at Fort Union at the mouth of the Yellowstone; and at Kansas City on the Missouri. Between 3,000 and 4,000 steamers arrive and depart annually. The interior is reached by river, railroad, and turnpike, but is not everywhere well accommodated with means of intercommunication. In 1850 the shipping owned in the state amounted to 23,907 (steam 24,955) tons, and in 1859 to 60,760 (steam 54,516) tons, of which a large portion was built within the state.—The railroads of Missouri, with two exceptions, have their initial point at St. Louis; these are the Pacific, with a direct westerly course to the Kansas line of 280 m., and its S. W. branch, which takes the course indicated by its name, leaving the main line at Franklin, and terminating in the S. W. corner of the state, with a length of 262 m.; the North Missouri, which passes N. W. to the southern line of Iowa, with a length of 236 m.; and the St. Louis and Iron mountain, which has its S. terminus at Pilot Knob, 84½ m. distant from St. Louis. The Hannibal and St. Joseph railroad extends across the state 206 m. Other railroads in progress or projected are: the Cairo and Fulton, the length of which in this state is 77 m.; the Keokuk and Kansas, the Canton and Bloomfield, the Lexington and St. Louis, the Cape Girardeau and Pilot Knob, the Randolph and Chariton, and the Platte country railroads. The completed portion of these railroads and their cost to the end of 1859 were as follows:

| Railroads. | Miles. | Cost. |
|----------------------------------|--------|--------------|
| Cairo and Fulton..... | 21 | \$420,366 |
| Hannibal and St. Joseph..... | 206 | 7,669,705 |
| Quincy and Palmyra..... | 12 | 200,000 |
| North Missouri..... | 183 | 5,632,521 |
| Pacific..... | 168 | 10,038,823 |
| S. W. Branch..... | 48 | 1,442,710 |
| St. Louis and Iron Mountain..... | 84½ | 5,200,744 |
| Total..... | 719½ | \$30,589,869 |

In the cost is probably included that of other portions of the several roads in progress. The building of these roads has been aided by grants of land by congress and by bonds guaranteed by the state. The length of post routes at the end of June, 1853, was 14,685 m., of which 205 m. were by railroad, 614 m. steam naviga-

tion, 3,156 m. coach road, and 10,710 m. not specified. The telegraph connects all the river towns with St. Louis, and the most important towns are connected with the lines extending to the Atlantic seaboard. On Jan. 1, 1860, Missouri had 9 banks, the condition of which was as follows: Liabilities: capital, \$5,796,781; circulation, \$4,157,886; deposits, \$3,894,623; profits on hand, \$305,001. Resources: notes, bills of exchange, &c., \$10,814,877; specie, \$4,169,905; real estate, \$169,459; total, \$14,654,241.—The constitution of Missouri grants the elective franchise to every free white male citizen of the United States, 21 years of age, who has resided in the state 1 year and in the place of voting 3 months. General elections are held on the 1st Monday in August. The general assembly is composed of a senate of 18 members, elected in districts for 4 years, one half biennially, and a house of representatives of 49 members, elected for 2 years. Senators must be 30 years of age, and have resided in the state 5 years; and representatives must have resided in the district from which chosen 2 years. Both must be citizens of the United States. The legislature meets at Jefferson City biennially (even years), on the last Monday of December. The governor (salary \$3,000 and furnished house) and the lieutenant-governor (paid as president of the senate \$7 per day while sitting) are elected by the people at large for 4 years, and cannot serve 2 terms successively; they must be native-born citizens, or have been citizens of the United States in 1820, or inhabitants at the period of the cession by France in 1803. The principal administrative officers are the secretary of state (salary \$1,800 and fees), superintendent of public schools (\$1,500), auditor (\$1,850 and fees), treasurer (\$1,850 and fees), attorney-general (\$1,600 and fees), &c. Most of the above officers are required to reside at the capital during their terms of office. The judiciary consists of a supreme court, 16-circuit courts, county courts, &c. The supreme court has 3 justices (salary \$3,000) elected for 6 years, and holds two sessions annually, one at Jefferson City and one at St. Louis. A circuit court is held twice a year in each county. Its jurisdiction extends to all matters of tort and contract over \$90 where the demand is liquidated, and over \$50 where the agreement is parole. It has exclusive commercial jurisdiction, and a supervision over the county courts and justices of the peace, subject however to the correction of the supreme court. The judges of the circuit courts (salary \$1,500) are elected in their respective districts for 6 years. The jurisdiction of the county courts is limited to matters of probate and local affairs; the county court is composed of 8 justices elected for 4 years. In addition to the circuit and county courts, St. Louis has a court of common pleas (with jurisdiction similar to the circuit court), a criminal court, a district court of probate, a recorder's court, and a land court, having sole jurisdiction in St. Louis county in

suits respecting lands, actions of ejectment, dower, partition, &c. Judges of the common pleas and criminal courts are elected for the same term as the circuit judges. Hannibal, St. Joseph, Cape Girardeau, Independence, and Weston have also separate courts of common pleas.—The revenue of the state is derived principally from taxation, poll tax, licenses, bank stock dividends, &c. The resources of the treasury for the two years ending Sept. 30, 1850, amounted to \$1,192,498, and for the two years ending Sept. 30, 1858, to \$1,861,862. The expenditures for the same periods were \$871,818 and \$1,182,175. The state debt proper amounts to \$602,000, on which the annual interest is \$35,805. The state has also lent its credit to railroad companies to the large amount of \$30,101,000, and will increase this to \$24,950,000. The following was the condition of the railroad loans, July 18, 1859:

| Name of company. | Amount authorized. | Amount loaned. | Amount to be loaned. |
|----------------------------|--------------------|----------------|----------------------|
| Hannibal and St. Joseph. | \$3,000,000 | \$3,000,000 | .... |
| Pacific, main line | 7,000,000 | 7,000,000 | .... |
| " S. W. branch | 4,500,000 | 1,900,000 | \$3,600,000 |
| North Missouri | 5,500,000 | 4,850,000 | 1,150,000 |
| St. Louis and Iron M'n' .. | 3,800,000 | 3,501,000 | 99,000 |
| Cairo and Fulton | 850,000 | 850,000 | 300,000 |
| Platte Country | 700,000 | .... | 700,000 |
| Total | \$34,950,000 | \$30,101,000 | \$4,849,000 |

As security for these bonds the state holds mortgages on the roads and their properties, also on the lands granted by congress in aid of their construction. The assessed valuation of taxable property in the state in 1850 was \$98,595,468, and in 1857 \$268,789,241. The principal institutions supported wholly or in part by the state are the state lunatic asylum and the deaf and dumb asylum, both at Fulton, the asylum for the blind at St. Louis, and the state prison at Jefferson City. Whole number of paupers supported in whole or part within the year ending June 1, 1850, 2,977; number at that date, 505; annual cost of support, \$53,248. Whole number of criminals convicted within the same year, 908; number in prison at that date, 180.—In 1850 the number of children returned as having attended school any part of the year was 95,285, or one in every 6.28 of the free population. The school statistics as reported on June 1 of the same year were as follows: 1,570 primary and public schools, with 1,620 teachers, 51,754 scholars, and an annual income of \$160,770; 204 academies and private schools, with 868 teachers, 8,829 scholars, and an income of \$143,171; 9 universities and colleges, with 65 teachers, 1,009 students, and an income of \$79,528; total, 1,783 institutions, with 2,058 teachers, 61,592 scholars, and an income of \$383,469. In 1858 there were in operation 3,382 common schools, with 4,397 teachers. The school fund held by the state amounts to \$575,668, the interest from which is distributed semi-annually to the counties *pro rata*; and one fourth part of the whole revenue of the state is appropriated for the support of common schools. The number of free persons

over 20 years of age in 1850 unable to read and write was 86,778, of whom 86,281 were whites and 497 free colored persons. The principal collegiate and professional schools within the state are: the university of St. Louis at St. Louis, founded in 1822, and its medical department, 1836; St. Charles college at St. Charles, 1837; Missouri university at Columbia, 1842, and its medical department at St. Louis, &c., 1846; St. Vincent's college at Cape Girardeau, 1848; Masonic college at Lexington, 1844; Fayette college at Fayette, 1848; Westminster college at Fulton, 1851; Chapel Hill college at Chapel Hill, 1852; William Jewett college at Webster, 1852; Grand River college at Trenton, 1855; theological seminary (R. C.) at St. Louis; St. Mary's ecclesiastical (R. C.) seminary at Barrons, Perry co., and a number of other theological schools, &c.—The whole number of churches in the state in 1850 was 830, with accommodation for 251,068 persons, and valued as property at \$1,561,610. Of these, 304 were Baptist churches, 57 Christian, 11 Episcopal, 18 free, 2 Jewish, 24 Lutheran, 1 Mennonite, 268 Methodist, 3 Moravian, 128 Presbyterian, 68 Roman Catholic, 11 union, 2 Unitarian, 1 Universalist, and 21 others. The number of newspapers and periodicals in 1850 was 61, which circulated annually 6,195,560 copies; of these, 5 (3,880,400 copies) were published daily, 4 (278,000 copies) tri-weekly, 45 (2,406,560 copies) weekly, and 7 (185,600 copies) monthly; and 17 (608,800 copies) were literary and miscellaneous, 42 (5,496,380) political, and 2 (90,480) religious. The number of libraries in the state, other than private, was 97, containing 75,056 volumes, viz: 18 (23,106 vols.) public, 18 (17,150 vols.) school, 66 (14,500 vols.) Sunday school, 4 (19,700 vols.) college, and 1 (600) church.—In legal proceedings the region now known as Missouri was included by the French and Spanish in the Illinois country, but popularly and historically it was denominated Upper Louisiana. The states of Arkansas and Iowa and the great territories of Kansas and Nebraska were parts of the same grand division. Situated in the central part of the valley, the settlement and progress of Missouri were later and less rapid than those of the lower districts; but as early as 1720 its lead mines had already attracted attention. In 1755 Ste. Genevieve, its oldest town, was founded. In 1763 the jurisdiction of the country passed from France to Spain and England, the Mississippi being the dividing line between their respective apporportionments. France had been despoiled of all her North American possessions. During the contest numbers of Canadian French emigrated by way of the lakes, and going south settled in both Upper and Lower Louisiana, giving the first impulse to the permanent settlement of Missouri; and a flourishing river trade sprang up between the two sections. The character of the new government (Spanish) was conciliatory; lands were granted liberally to the colonists, and numerous emigrants from Spain flocked into the country. In 1775 St. Louis,

originally a depot for the fur trade, contained 800 inhabitants, and Ste. Genevieve about 460. At this time the American revolution was commencing, and Spain, siding with the colonists, entered into hostilities against England. In Lower Louisiana and Florida the arms of Spain were successful; but in 1780 St. Louis was attacked by a body of English and Indians from Michilimackinac, and was only relieved by the timely arrival of Gen. Clark from Kaskaskia. The general peace of 1783 put an end to hostilities; Spain retained her previous possessions, and received in addition the whole of Florida, of which she had been deprived 20 years before; and the eastern bank of the Mississippi, including all the Illinois country, was ceded to the United States. Emigration into Spanish Louisiana began once more on the restoration of peace, and many persons from the western part of the United States moved into Missouri. Disputes soon arose between Spain and the United States. A disagreement relative to the navigation of the great river was settled by treaty in 1795, by which Spain granted to the United States free navigation; but the stipulations on the part of Spain were not faithfully carried out, and it is probable that war would have broken out had not the country been ceded back in 1800 to France, by which it was sold to the United States in 1803. The country purchased was immediately divided into the "territory of Orleans" and the "district of Louisiana." The latter was erected in 1805 into the territory of Louisiana, and St. Louis became the seat of its government. In 1812, on the admission of the present state of Louisiana into the Union, the name of the territory was changed to Missouri, and its government made representative. The limits on the west were gradually extended by treaties with the Indians. In 1810 the population numbered 20,845, of whom all but about 1,600 belonging to Arkansas were settled within the present limits of Missouri. Immigration now came in rapidly from the East. In 1817 the total population had increased to 60,000, and St. Louis counted at this time 5,000 inhabitants. It had already become the emporium of the upper Mississippi. In this year the assembly applied to congress for permission to frame a state constitution preliminary to admission into the Union. Now commenced that great struggle to prevent the extension of slavery into the new states, which was settled by the celebrated compromise of 1820, whereby it was determined that Missouri should come into the Union as a slaveholding state, but that slavery should never be established in any states formed in the future from the lands lying to the N. of lat. 36° 30'. The state constitution was framed by a convention of 40 delegates convened at St. Louis, July 19, 1820; and the state was admitted by proclamation of the president, Aug. 10, 1821, on the compliance of the legislature of Missouri with the requirements of the act of congress passed Feb. 27 of that year. From this time until the

present the progress of the state in material prosperity has been rapid; immigration has constantly been augmenting its population, which by the U. S. census of 1860 probably amounts to about 1,200,000; and agriculture, mining, commerce, and manufactures have been expanded into vast interests, whose products are rapidly increasing in value and importance.

MISSOURI (*i. e.*, Mud river), a large river of the United States, and the principal tributary of the Mississippi. It properly forms one stream with the Mississippi, being much greater in length and volume than the other branch which bears that name above the mouth of the Missouri. It rises near the boundary between Oregon and Nebraska, but within the latter territory, among the Rocky mountains, in several small streams, the principal of which are Jefferson and Wisdom rivers (the latter rising within a mile of the head springs of Clark's fork of the Columbia), whose sources lie between lat. 44° 20' and 45° 85' N. and long. 112° and 114° W., and which unite about lat. 45° 15', long. 112°. According to some geographers, however, the Missouri properly begins about 80 m. further E., where the stream formed by the Jefferson and Wisdom, which on this hypothesis retains thus far the former name, is joined by the Madison and Gallatin. After a devious course N. from the latter point to about lat. 48°, the Missouri runs E. to the frontier of Dacotah, where it is joined by (lesser) White Earth river. Its general direction is S. E. thence to the Mississippi, which it joins in lat. 38° 50' 50" N., long. 90° 14' 45" W., after separating Nebraska on the W. from Dacotah and Iowa on the E., forming a small part of the dividing line between Missouri and Kansas and Nebraska, and also flowing across the whole state of Missouri. Its length is 3,096 m., which, added to 1,410 m., the length of the lower Mississippi, makes its whole course, from its source to the gulf, 4,506 m. It has commonly been navigated as far as the mouth of the Yellowstone, in the N. E. part of Nebraska, but it may be ascended by steamboats much further than this, to the Great falls almost at the very base of the mountains, and about 2,540 m. from the Mississippi. There is no serious obstruction to navigation below this point, though at certain seasons of the year the water is shallow, owing to its passing through a dry and open country in its upper course, and being subject to extensive evaporation. It is generally turbid and rapid. In its lower course it is bordered by a narrow alluvial valley of great fertility, back of which lie generally extensive prairies. At its mouth it is over half a mile wide, and in many places it is much wider. Its principal tributaries are the Yellowstone, Little Missouri, Big Cheyenne, (greater) White Earth, Niobrara, Platte or Nebraska, Kansas, and Osage on the right, and the Milk, Dacotah, Big Sioux, Little Sioux, and Grand on the left. The Yellowstone drains the whole of central and a large part of western Nebraska, collecting the waters of a great number of smaller streams

which flow between the Black hills and the Rocky mountains. It is 800 yards wide at its mouth, or about equal in size to the Missouri at the point of junction. The Little Missouri comes from the valley between the Black and Turtle hills, running almost parallel with the Yellowstone, and is about 800 m. long. The Cheyenne or Washteg and greater White Earth or Mankizitah rise near the S. base of the Black hills, in the central part of Nebraska, and flow E.; the former is 400 yards wide at its mouth, and the latter 800. The Ni-obrarah, or Eau qui Court, is formed by two considerable streams, one of which rises near the source of the White Earth and the other further to the S.; its length from its remotest source is not much under 500 m. The North fork of the Nebraska or Platte river rises near the N. W. corner of Kansas, and makes a long detour to the N. W., almost interlocking with the head streams of the Yellowstone. It then flows S. E., and in lat. 41°, long. 100° 30', is joined by the South fork, which has its sources about Pike's peak. The united stream thus drains the whole of southern Nebraska, and falls into the Missouri 600 m. from its mouth, being 600 yards wide at the point of confluence. The constituents of the Kansas river are the Republican and Smoky Hill forks, which water the N. and central parts of the territory, and the Kansas also receives numerous smaller tributaries; its width at its mouth is 288 yards. The Osage, about 400 yards wide at the point of junction, is the principal stream of southern Missouri. The Milk river, on the left bank, draws its waters partly from British America. The Dacotah, Tohansansan, or Rivière à Jacques, is the principal water course of Dacotah, and is 450 or 500 m. long. The Big Sioux runs nearly parallel with it at a distance of about 50 m., and its length may be estimated at 300 m.; its embouchure is 110 yards wide. The Little Sioux, or Inyan Yanke, belongs to the western part of Iowa. Grand river rises in southern Iowa, and drains the N. W. part of Missouri; its width at its mouth is 190 yards. It will thus be seen that the Missouri receives all the great rivers which rise on the eastern declivity of the Rocky mountains, with the single exception of the Arkansas, and a large share of the waters which lie between its own bed and that of the upper Mississippi. The area which it drains is estimated at 519,400 sq. m. Passing as it does through a newly settled country, there are few large cities and towns on its banks; the most important are Omaha City in Nebraska, Atchison and Leavenworth in Kansas, and St. Joseph, Kansas City, Lexington, Booneville, Jefferson City, and St. Charles in Missouri. About 411 m. from its source the river passes through a narrow gorge denominated the "Gates of the Rocky mountains." It is 5½ m. long, and the perpendicular walls of rock, which rise directly from the water to the height of 1,200 feet, are only 450 feet apart. For the first 8 m. there is but one spot where a foothold could be obtained between the water and the rock. The

Great falls occur about 145 m. below this point. They are the grandest on the North American continent after those of Niagara, and consist of 4 cataracts, respectively of 26, 47, 19, and 87 feet perpendicular descent, separated by rapids. The whole fall in 16½ m. is 857 feet.

MISTAKE. The principles of law in relation to mistake are of much practical importance. That which is most general, and may be regarded as fundamental, is, that no man shall avail himself, either to establish or resist a claim, of his mistake or ignorance of law. So also in criminal law it is an ancient maxim: *Ignorantia legis neminem excusat*. The reason sometimes assigned, that the law supposes every one to be acquainted with it, is nothing more than a repetition of the rule in other words. The true reason is, the extreme danger of permitting any person to shelter himself under his ignorance of the law, or to found a right upon it. For this would be, in the words of the king's bench in England, "to hold out a premium for ignorance;" and ignorance of that which it is of the utmost importance that all men should know. Hence the law distinguishes most carefully between a mistake of law and a mistake of fact; for the latter is, as a general rule, rectified, and all mischievous consequences prevented, as far as possible; and a mistake as to the law of a foreign state or country is regarded only as a mistake of fact, because no one is under any obligation to become acquainted with a foreign law.—To this general rule there are some important qualifications; the principal one being, that no mere acknowledgment, or waiver of defence or right, made under a mistake of law, is binding. Thus, if one has a good legal defence against a promissory note, but, by an ignorance or mistake of the law, supposes himself bound to pay it, and on this supposition gives a promise to pay it, the promise will not, in general, be binding upon him. There is also, in many cases, much relief to be obtained by the construction of a contract; but this is always governed and limited by certain definite rules. It is often stated by ethical writers, that a party to a contract is bound to execute the contract in the sense which he knew the other party to put upon it. This may be true always in a moral sense; but it certainly is not true in a legal sense, although courts have sometimes seemed to think it was a good rule of law. The true rule and the reason of it are easily seen. If A contracts with B in writing to sell him 100 mules, and receives the money, and B at the time, being a foreigner perhaps or for some other reason, understood that he was buying horses, all which A knew, nevertheless B could not claim horses under the contract. He could, by proving his mistake and A's knowledge of it, make out a case of fraud, and this would annul the contract, and then he could recover his money from A. But the reason why he could do no more is, that the law will not, under pretence of construing a contract, make a new contract for the parties. Hence, it is another way of ex-

pressing the same rule, that the actual intention of the parties to a contract shall be carried into effect, so far as it is possible to arrive at that intention by a rational construction of the words they have actually used, but no further; for it is one of the most reasonable, safe, and well established rules, that no evidence from without a written contract shall be permitted to control or vary it. While parties are negotiating they may change their minds and vary their demands and concessions, and generally do this to some extent. But when they have finally put their terms in writing, the law supposes that these are what they have concluded upon, and that they have chosen and used the very words which express their meaning; and that whatever is not therein stated, although it may have previously passed between them, has been purposely omitted because it was not finally agreed to. It would therefore be manifestly unjust to permit evidence of any of these things to come forward and vary the written contract; and hence the rule, which is concisely expressed in the Scotch law thus: "Writing cannot be cut down or taken away by the testimony of witnesses." But while evidence must not vary, it may explain, the contract. Thus, in the most solemn deed, it may be necessary to explain the terms of the instrument, in order to show who the parties are, what the boundaries of land mean, or where it is situated. But it is a very different thing when one of the parties says that the deed contains a mistake; that the house or the field it conveys is not the house or field which it was intended to convey; and on this ground demands to hold the house or field which, as he alleges, should have been given to him. And it may be regarded as the established rule concerning mistakes, that any mistake in an instrument may be corrected, if the instrument itself affords the means of correction; but not, if it can be done only by going outside of the instrument. Questions of this kind frequently occur in the construction of wills; and sometimes they present extreme difficulties. Thus, if a legacy is given, and the name of the legatee describes no one perfectly, or is equally applicable to two persons, it is, in the first place, certain, that if any thing else in the will will clear up the question, it will be used for that purpose; and, secondly, that if it is a case of mere obscurity, evidence may be received to clear up that obscurity; but if the case is one which is without any question of itself, evidence cannot be admitted to show that the testator meant something else than that which he has distinctly said, and thus to rectify a mistake. A strong case is cited in the English books, where an attorney employed to draw a will for a sick man, wrote his own name in the place of one whom he was directed to make a legatee of a large sum, and the will was so executed. The facts being proved, the intended legatee claimed the legacy, by correction of the mistake into which the attorney had led the testator. But it was held that this was impossible by the rules of

law. Then, however, a court of equity decreed that the attorney should take the legacy, but only as a trustee for the intended legatee, and immediately pay it over to him. This must be regarded rather as suppressing a fraud, and establishing and enforcing an equitable trust, than as an exercise of the equity power of correcting a mistake; for the extensive and very beneficial power which a court of equity has in cases of mistake is exercised in general between parties to an instrument. (See CHANCERY, and EQUITY.)

MISTLETOE, or MISSELTÖE (*viscum album*, common mistletoe or mistelden), a parasitical plant belonging to a genus embracing 76 species (Don), of which number this is the only one found in Europe. The word is supposed by some to be derived from the German *Mist*, dung or slimy dirt; by others from *mistelta*, the Saxon for the plant. The berries, which are usually white, secrete a slimy juice, and are used in making bird lime; whence *viscum* in Latin and *μῆκος* in Greek signify both mistletoe and bird lime. The mistletoe belongs to the natural order *Loranthaceæ*, evergreen shrubs, with forked-branched stems, parasitically implanting themselves in the woody portions of various trees, sometimes insinuating themselves by creeping roots under the bark, and seldom growing in the ground. The flowers of some of the species are imperfect, small, inconspicuous, white or greenish yellow; of others they are perfect, beautifully colored, very showy, variously diffused over the plants, and frequently having from one to many bracts. Most of the order occur in tropical regions, a few only being found elsewhere. The common mistletoe is found in England, and is familiarly known there on account of various customs, traditions, and superstitions connected with it. It is an evergreen bush attached to the trunks and branches of trees, composed of dichotomous shoots, opposite leaves, and yellow flowers, which are succeeded by fruit which is almost always white, but there is said to be a variety with red fruit. The plant is seldom more than 3 or 4 feet in diameter; it is thickly crowded with branches and leaves. Its growth is slow, seldom more than 2 or 3 inches of the shoot and 2 or 3 pairs of leaves being produced in a season. The leaves vary considerably in different plants. The durability of the plant is proportionally great, for when once established on a tree it is seldom known to cease growing while the tree lives.—The mistletoe is commonly propagated by its berries being made to adhere by some means or other to the bark of a living tree. It is supposed that birds which feed upon these berries wipe off some of the seeds which adhere to their bills by rubbing them against the bark. We are informed by an eye witness that in a similar manner the seeds of orchidaceous epiphytes are lodged on trees, and even on other and dead substances, by the birds which feed upon the fruits in tropical parts of South America, where these splendid vegetable productions abound in the forests.

Such seeds soon vegetate, and even put forth a few leaves, but perish unless lodged upon living trees or in appropriate places. Ray suggested the experiment of artificially planting the berries of the mistletoe in or upon the smooth bark, and the trial succeeded. In 1838 Mr. Baxter, of the Oxford botanic garden, England, rubbed 9 mistletoe seeds on the smooth bark of an apple tree, all of which germinated. Duhamel succeeded in making them sprout upon other substances, such as bricks, tiles, stones, the ground, &c., but the plants did not long survive. It is a well known law in vegetation that the young root or radicle, as it protrudes from the seed, seeks to descend and plunge itself deeply in the soil; but it has been ascertained that in the seed of the mistletoe the radicle invariably turns itself toward the surface of the body to which the seed has been affixed; so that it happens that sometimes the young root has first to raise itself up and then bend over until it reaches the surface of the bark or other substance. Having done so, the point of the radicle swells out into a sort of disk, the better to attach itself. Generally a single radicle belongs to a seed, especially if the seed be of an oval form; but if it is triangular or irregular, 2, 3, or more appear. Seeds artificially attached to a cannon ball, suspended by a cord at some distance from the earth, were found to direct their radicles to the surface of the ball, whether they were on the upper or lower surface or upon the sides. This peculiarity secures their growth upon every surface of the branches of trees. A seeming explanation has been proposed by supposing that the radicle seeks to avoid the light; and Dutrochet found, indeed, that when he glued the seeds upon the inside or upon the outside of the panes of a window, in each case the young roots were found to be seeking the interior of the room. The facility of thus growing under any circumstances upon the trees which the plant affects, determines somewhat the future size and shape; as for instance, when the germination occurs upon the upper side of a branch, the shoots bend upward; but if it occurs on the under side, the shoots descend; and if, again, the shoots start on the side of a perpendicular trunk, they proceed to grow horizontally, spreading of course with the growth of the plant so as to ultimately form a hemispherical bush. The roots of the mistletoe which penetrate the bark extend themselves between the inner bark and the soft wood, where the sap is most abundant, sometimes sending up suckers at a distance from the point where the roots entered. These roots after a while become imbedded in the solid wood, and hence has arisen the opinion that the mistletoe actually roots itself into the solid wood as well as into the living bark; which would be very unlikely, as no nutriment, such as it wants, could be drawn from thence. It is generally admitted, too, that the mistletoe robs the branch of its ascending and descending sap, and thus is inju-

rious in its presence; hence in orchards it is customary to remove it as soon as it appears. —Several kinds of birds eat the berries; they are the favorite food of the missel thrush. As a medicine the plant was once considered valuable in the treatment of epilepsy, and the Romans prized it as an antidote to poisons. Its principal use now is to hang up with holly in rooms at Christmas. The custom of kissing under it at that festive season is referred to the supposition on the part of some that it was the forbidden tree in the garden of Eden. This pleasant Christmas custom Mr. Loudon supposes most likely came from our Saxon ancestors, and to have been commemorative of Baldur the son of Odin. In the feudal ages, the same writer adds, it was gathered with great solemnity on Christmas eve and hung up in the great hall with loud shouts and rejoicings. Among the druids the mistletoe was considered sacred if found growing upon the oak, and was possibly rendered thus valuable from its rarity; for its appearance on that tree is now so rare that the druids' mistletoe is conjectured by some to have been some other plant. The tradition is, that it was cut from the oak with great ceremonies on the first day of the new year, and at that time consecrated to their chief deity on account of the extraordinary virtues they attributed to it. Pliny, among other ancient writers, gives a similar account. It was also used in religious ceremonies by the Persian magi.—The representative of the mistletoe in the western and southern portions of the United States is *phoradendron flavescens* of Nuttall, which grows chiefly upon the branches of elms and hickories; a yellowish green, woody-stemmed parasite, with a jointed stalk having opposite and whorled branches, fleshy, obovate-shaped leaves, small flowers in axillary spikes, which are shorter than the leaves, and fruit of white, glutinous berries. (Chapman's "Flora of the Southern United States," New York, 1860.) This species has a wide distribution from New Jersey westward, and southward to Mississippi and Florida. A botanical exploration of New Mexico in 1846, by Mr. Augustus Fendler, enabled Dr. Engelmann and Prof. Asa Gray, at whose suggestion and with the assistance of the secretary of war it was undertaken, to arrange and describe other American mistletoes. This arrangement can be found in the "Memoirs of the American Academy," new series, vol. iv. p. 58 (Cambridge and Boston, 1849), where 6 species of *phoradendron* are noticed, including the present and the *P. Californicum*, with the *P. tomentosum* (De Candolle), the others being new. An allied genus, *arcanthobium* (M. Bieb.), comprises two species, viz.: the *A. ozycedr*, parasitic on the *pinus edulis*, which grows on the mountain sides around Santa Fé, and the *A. cryptopodon* (Engelm.), parasitic on the *pinus brachyptera*, which grows in western New Mexico. For further information on these American forms, consult the "Reports of Explorations and Surveys for a Railroad Route to the Pacific," vol. iv. p. 184.

MITAU, or MITTAU (Russ. *Mitavo*; Lettish, *Yelgawa*), a town of European Russia, capital of Courland, in a low marshy district adjoining the Aa, 25 m. S. W. from Riga; pop. in 1852, 18,819, chiefly Germans, including many Jews. The principal public edifices are the castle, once the residence of the dukes of Courland, the Greek, Catholic, and Protestant churches, &c. Linens and hosiery are manufactured. Louis XVIII. and his court chiefly resided there from 1798 to 1807.

MITCHEL, a N. co. of Iowa, intersected by the Red Cedar river and its east fork; area, 481 sq. m.; pop. in 1859, 8,291. The productions in 1859 were 15,879 bushels of wheat, 28,487 of oats, 43,380 of corn, 12,436 of potatoes, 51,680 lbs. of butter, and 4,188 tons of hay. It has been but recently settled.

MITCHEL, JOHN, an Irish revolutionist, born Nov. 8, 1815, in the town of Dungiven, county of Derry, where his father officiated as a minister of the Unitarian persuasion. He was graduated at Trinity college, Dublin, in 1836, studied law, and practised his profession for 6 years in Newry and Banbridge, during the stormy period of O'Connell's "monster meetings," his arrest, trial, and imprisonment. In 1843, on the death of Thomas Davis, the colleague of Mr. Gavan Duffy in the "Nation," Mitchel was called to Dublin to succeed him. His articles were revolutionary in spirit, and for one which appeared in 1846, showing how the people could contend with the army, and advocating the use of vitriol against the troops in case of a conflict in the streets, the "Nation" was prosecuted by government. In consequence of the pruning to which his articles were subsequently subjected, he quarrelled with Duffy toward the end of 1847, and soon after founded "The United Irishman," an organ which teemed with legal treason, and brought him in direct collision with the government. After an existence of 8 months the journal was suppressed, and its editor sentenced to expatriation for the term of 14 years. On May 27, 1848, after two weeks' incarceration at Newgate, Mr. Mitchel was taken in irons from Dublin to the convict depot of Spike island (Cork harbor), where a government order was received to treat him "as a person of education and a gentleman." Taken thence in a day or two, on the Scourge sloop of war, he passed 10 months of his sentence in the island of Bermuda, whence he was again deported to Australia. Here he met Messrs. Smith O'Brien, Meagher, Martin, and other political associates whom he had left behind in Ireland, but who had met the same fate and were there before him. On July 19, 1854, Mr. Mitchel resigned his parole and effected his escape from the colony, landing in New York on Nov. 29. There he founded the "Citizen," a weekly journal, which he conducted for some time until failing eyesight constrained him to seek a more congenial climate. He removed to Tennessee, where he subsequently established the "South-

ern Citizen," in which among other measures he advocated the reopening of the African slave trade. This journal was afterward removed to Washington, and in 1859 ceased to appear. After its suspension Mr. Mitchel spent some time in France, but has since returned to the United States. He is the author of "Hugh O'Neill" and his own "Jail Journal," in which he details the events of his imprisonment. He has also edited the poems of Thomas Davis and James Clarence Mangan, with biographies of both.

MITCHEL, ORMSBY MACKNIGHT, an American astronomer, born in Union co., Ky., Aug. 28, 1810. At 12 years of age, with a good knowledge of Latin and Greek and the elements of mathematics, he commenced the world for himself as clerk in a store in Miami, O., and afterward removed to Lebanon, Warren co., where he had been educated. There he received a cadet's warrant, and earned the money that took him to West Point, which place he reached, with a knapsack on his back and 25 cents in his pocket, in June, 1825. On graduating in 1829, he was made acting assistant professor of mathematics, which post he held for two years. From 1832 to 1834 he was counsellor at law in Cincinnati, O.; from 1834 to 1844 professor of mathematics, philosophy, and astronomy at Cincinnati college; in 1836 and 1837 chief engineer of the Little Miami railroad; and in 1841 a member of the board of visitors of the military academy. In 1845, at the close of a course of lectures on astronomy in Cincinnati, he proposed the establishment of an observatory at that place; and the proposition having been at once carried out, mainly by his own exertions, he became director of the institution. The ground for the building was given by Nicholas Longworth, Esq. The building is of stone, 80 feet in length and 2½ stories high. The principal instrument is the great refractor equatorially mounted and made by Merz and Mohler of Munich. It cost \$10,000, which Prof. Mitchel obtained by subscriptions, mostly of \$25 each, in Cincinnati. In 1859 he became director of the Dudley observatory at Albany, retaining at the same time his connection with that at Cincinnati. Prof. Mitchel is eminent as a popular lecturer on astronomy, and scarcely less distinguished for his mechanical skill, by the aid of which he has perfected a variety of apparatus of great use to astronomy. One of the most important of his constructions is an apparatus at Albany for recording right ascensions and declinations by electro-magnetic aid to within 1/1000 of a second of time, and for the measurement with great accuracy of large differences of declination, such as the ordinary method by micrometer cannot at all reach. Prof. Mitchel has carefully investigated the velocity of the magnetic current. Among his discoveries are the exact period of rotation of Mars, and the companion of Antares or Cor Scorpii. The most popular and characteristic of his published writings is "Planetary and Stellar Worlds," a

collection of earlier public lectures. He is the author also of a treatise on algebra, and of a "Popular Astronomy." In July, 1846, he published the first number of the "Sideral Messenger," the first periodical attempted in the United States devoted exclusively to astronomy. About the end of the second year it was abandoned for want of patronage. Prof. Mitchell has devoted much time to the remeasurement of Prof. W. Struve's double stars south of the equator. The work was undertaken at the special request of that astronomer, and has resulted in a number of interesting discoveries.

MITCHELL, DONALD GRANT, an American author, born in Norwich, Conn., in April, 1822. He was graduated at Yale college in 1841, and after passing 8 years on a farm for the benefit of his health, during which time he corresponded on agricultural topics with the "Albany Cultivator," he travelled extensively in Europe. Returning home in 1846, he commenced the study of the law in New York, and in 1847 published, under the pseudonyme of "Ik Marvel," which he had employed as a newspaper correspondent, a volume entitled "Fresh Gleanings, or a New Sheaf from the Old Fields of Continental Europe," embracing his reminiscences of European travel. He soon after returned to Europe, and passed several of the most eventful months of 1848 in Paris and its environs, recording his experiences in "The Battle Summer" (New York, 1849). This was succeeded by a satirical work entitled "The Lorgnette," which appeared in numbers and anonymously, and was subsequently published in 2 vols. (1850). In the same year also appeared "The Reveries of a Bachelor," his most popular work, and in 1851 his "Dream Life." In 1853 he received the appointment of U. S. consul at Venice, and after holding that office a short time made another continental tour, and in 1855 returned to America. He has since resided on his farm in the neighborhood of New Haven. His last publication is "Fudge Doings" (3 vols. 12mo., 1854), a satire upon fashionable life in America, originally contributed to the "Knickerbocker Magazine." He has also delivered several agricultural addresses and lyceum lectures; and has long been engaged in writing a history of the republic of Venice.

MITCHELL, ELISHA, D.D., an American chemist and professor, born in Washington, Litchfield co., Conn., Aug. 19, 1793, lost his life on the Black mountain in North Carolina, June 27, 1857. He was graduated at Yale college in 1813, served there some time as a tutor, and in 1817 was elected professor of mathematics in the university of North Carolina, and entered on the duties of that office at the close of 1818. In 1825 he was transferred to the chair of chemistry, which he held during the rest of his life, giving instruction also in the various branches of natural history. In 1821 he was ordained by the presbytery of Orange, and was an able preacher and biblical scholar. He was for some time the state surveyor, and

made a careful geological and topographical exploration of its territory. He first ascertained that the mountains of North Carolina are the highest east of the Rocky mountains; and his name has for many years been given to what was thought their loftiest summit. It was to settle some disputed points in regard to these heights, that he ascended them once more in 1857, when, having lost his way at night, he fell down a precipice into a pool that feeds the Sugar Camp fork of Caney river, and was found there lifeless. His remains were interred on the topmost height of the mountain that bears his name. Dr. Mitchell published little, except in the "American Journal of Science" and the newspapers, though he printed a few controversial tracts, a treatise on geology, and one on chemistry, for the use of his own classes.

MITCHELL, JOHN KEARSELEY, M.D., an American physician, born in Shepherdstown, Jefferson co., Va., May 12, 1798, died in Philadelphia, April 4, 1858. His father, a physician of Scotch birth, sent him at the age of 8 years to be educated in Scotland. In 1818 he returned home, began the study of medicine with Dr. Kramer of Jefferson co., Va., and in 1819 was graduated at the university of Pennsylvania. After making three voyages to China in the capacity of surgeon to merchant ships, he settled in Philadelphia in 1822, and began to practise medicine and to teach physiology. In 1824 he lectured on the institutes of medicine and physiology in the Philadelphia medical institute. Two years later he accepted the chair of chemistry in the same school, and in 1833 was selected to lecture in the Franklin institute on chemistry applied to the arts. In the spring of 1841 he was called to the chair of the theory and practice of medicine in the Jefferson medical college of Philadelphia. At different times he was one of the physicians to the Pennsylvania hospital and to the city hospital. His services during seasons of pestilence were twice rewarded by municipal gifts. Beside a volume of poetry entitled "Indecision, and other Poems" (Philadelphia, 1839), and popular lectures on scientific subjects which were translated into several foreign languages, he left a work "On the Cryptogamous Origin of Malarious and Epidemical Fevers" (1849), and many valuable contributions to the "American Journal of the Medical and Physical Sciences." A collection of some of his essays, including a valuable paper on animal magnetism, was published in Philadelphia in 1858.

MITCHELL, MARIA, an American astronomer, born in Nantucket, Aug. 1, 1818. She is by birth and education a member of the society of Friends, and at the age of 11 entered a school kept by her father, partly as student and partly as assistant teacher. From the same parent, who was devoted to the study and practice of astronomy, she derived a fondness for that science; and by her intelligence in the use of instruments and her mathematical attainments, she soon became an enthusiastic coöperator in the observations carried on by him. Sub-

sequently she made many careful observations by herself, and devoted much time to the examination of nebulae and the search for comets. On Oct. 1, 1847, while engaged in this latter occupation, she discovered a telescopic comet, which was seen on the 8d at Rome by Father da Vico, and subsequently by other astronomers, and for which she received a gold medal from the king of Denmark. The elements of this comet were calculated by her and communicated to the Smithsonian institution; and she was afterward employed in observations connected with the coast survey and in the compilation of the nautical almanac authorized by government. Miss Mitchell is still diligently engaged in astronomical pursuits, having at her command for that purpose a well appointed observatory and the latest mathematical and scientific works, and is a regular attendant upon the meetings of the American association for the advancement of science, of which she was chosen a member on the nomination of Professor Agassiz. She is also a member of the American academy of arts and sciences, being the first female admitted into that body.

MITCHELL, THOMAS, an English scholar and philologist, born in London, May 30, 1783, died near Woodstock, May 6, 1845. He was the son of a riding master, and was graduated at Pembroke college, Cambridge, in 1806. A few years after he obtained a fellowship in Sidney Sussex college, but lost it after a limited time from his unwillingness to enter holy orders. He then engaged in private teaching and in writing for the press; and a series of essays by him in the "Quarterly Review," on Aristophanes and Athenian manners, commenced in 1813, was followed in 1820-'22 by a metrical translation of some of the plays of Aristophanes (2 vols. 8vo.). Rejecting, though without fixed means of support, an offer of a Greek professorship in Scotland, from repugnance to signing the confession of the Scottish kirk, he was employed at intervals for several years in editing Greek works printed at Oxford. He published in 1834-'8, in separate volumes, 5 of the plays of Aristophanes, with English notes; and afterward a complete edition of Sophocles, on the same plan, the first volumes of which were not well received, and which he was enabled to finish by a present, through Sir Robert Peel, of £150 from the royal bounty fund.

MITCHELL, SIR THOMAS LIVINGSTONE, a British engineer, born in Stirlingshire, Scotland, in 1792, died near Sydney, Australia, Oct. 5, 1855. He joined the British army in Spain in 1808, and attained the rank of major, and was afterward employed in making surveys and military maps of the peninsular battle fields. In 1827 he was appointed deputy surveyor-general of eastern Australia, and ultimately surveyor-general, which office he held till his death. He conducted 4 remarkably successful expeditions into the interior of the Australian continent, the first of which, in 1831-'2, resulted in the discovery of the Peel and Namboy rivers; and

during the 2d and 3d, in 1835-'6, the Darling and Glenelg rivers were explored, and Australia Felix discovered. The 4th, commenced in Dec. 1845, and finished in Dec. 1846, was undertaken to trace out a route from Sydney to the gulf of Carpentaria; the loss of their cattle and horses prevented the explorers from completing the expedition, but they discovered the Victoria river. In the interval between the 3d and 4th expeditions Major Mitchell visited England, and published a narrative under the title of "Three Expeditions into the Interior of Eastern Australia, with Descriptions of the recently explored Region of Australia Felix," &c. (2 vols. 8vo., London, 1838). His account of the last expedition appeared in 1848, under the title of "Journal of an Expedition into the Interior of Tropical Australia." In 1853 he again repaired to England, and delivered a lecture, which was published, on the boomerang propeller, which he had invented, for steam vessels. He was knighted in 1839, and made a colonel in 1854. Oxford university conferred on him the honorary degree of D.O.L.

MITCHELL'S PEAK. See BLACK MOUNTAIN.

MITCHILL, SAMUEL LATHAM, M.D., LL.D., an American physician, born in North Hempstead, Long Island, Aug. 20, 1764, died in New York, Sept. 7, 1831. He was graduated as M.D. at the university of Edinburgh in 1786, and returning to America the next year, devoted some time to the study of law under Chief Justice Yates of New York. In 1788 he was a commissioner for treating with the Iroquois Indians for the purchase of land; in 1790 he was a representative from Queen's county in the state legislature; and in 1792 he was appointed professor of chemistry, natural history, and philosophy in Columbia college, where he first introduced the system of nomenclature invented by Lavoisier. His dissent from some of Lavoisier's principles involved him in a controversy with Dr. Priestley, which was conducted with remarkable good temper and led to a lasting friendship between the two disputants. In 1793-'4 Dr. Mitchill founded, with Chancellor Livingston and Simeon De Witt, the society for the promotion of agriculture, manufactures, and the useful arts, at the request of which he made a geological and mineralogical tour along the banks of the Hudson (1796), presenting the results of his observations in a report which established his reputation at home and in Europe. In the following year he began, in conjunction with Dr. Edward Miller and Elihu H. Smith, the quarterly "Medical Repository," of which he continued the editor for 16 years. It was the first scientific periodical published in the United States. About the same time he was elected a member of the legislature by the city of New York. In 1801 he became a representative in congress, and in 1804 was chosen to the U. S. senate. At the expiration of his term of office he was again elected to the house of representatives. On the establishment of the

college of physicians and surgeons (1807) he was appointed to the chair of chemistry, which his other duties induced him to decline; but in the following year he accepted the professorship of natural history, retaining it until the reorganization of the college in 1820, when he became professor of botany and materia medica. The institution was broken up in 1826 by the retirement of the whole faculty, and gave place to the Rutgers medical school, of which Dr. Mitchill became vice-president. His death was caused by a pneumonic disease of a few days' duration. Though widely respected in his lifetime as a man of extraordinary learning, Dr. Mitchill was occasionally the victim of the satirical wits of New York, and the poems of "Croaker and co.," to which Fitz-Greene Halleck was a contributor, contain records of some of his eccentricities. He proposed to change the name of this country to "Fredonia," and wrote in 1804 "An Address to the Freedes, or People of the United States." He was one of the early supporters of Robert Fulton, whom he accompanied in 1807 in the first steamboat journey on the Hudson. He was the author of "Observations on the Absorbent Tubes of Animal Bodies" (12mo., New York, 1787); "Nomenclature of the New Chemistry" (1794); "Present State of Learning in the College of New York" (1794); "Life, Exploits, and Precepts of Tammany, the famous Indian Chief," a half historical, half fanciful address before the Tammany society of New York (1795); "Synopsis of Chemical Nomenclature and Arrangement" (1801); and various addresses, &c., beside a number of valuable papers in the transactions of several learned societies.—See "Reminiscences of Samuel Latham Mitchill, M.D., LL.D.," by John W. Francis, M.D. (New York, 1859).

MITE, a name applied to many very small articulated animals, of the arachnoid order and sub-order *acarina*, including the ticks, itch insects, and other parasites, and the minute acari. The abdomen is unarticulated, and fused with the cephalothorax; the external envelope is of chitine, solid and indestructible; 4 pairs of feet on the cephalothorax, armed with nails, and in some provided with long pedunculated disks by which the animal is attached; some, when young, have 6 feet; eyes usually absent; mandibles wanting, the antennæ being changed into prehensile and masticatory organs, moving vertically, piercing or cutting as may be necessary, and sometimes enclosed in a sheath in the form of a sucker. The stomach has several cæcal appendages, and the short and straight intestine opens near the middle of the abdomen; salivary glands well developed; no apparent heart nor blood vessels, the colorless nutritive fluid filling all the interstices of the body, and being irregularly circulated by the muscular movements and the contractions of the intestinal canal; respiration aerial, performed chiefly by the skin, and in some by tracheæ. The sexes are separate; many have an ovipositor, by which they insert their eggs under the

epidermis of plants and animals, in the latter case often causing great irritation; some surround their eggs by a tough substance which glues them to various objects. Their extreme minuteness in some cases may be judged of by the fact that they infest flies and very small insects; they are exceedingly prolific. Some live under stones, others on plants, on animals, or among decaying organic substances, and a few are aquatic; the parasitic ones, sucking the blood of animals and man, are sometimes very annoying, as the experience of most travellers and woodsmen testifies. The itch insect has been described under *ITCH*, and the ticks and other mites under *EPIZOA*. Among the mites, the *acarus domesticus* is found especially in old cheese (the powder of which, so agreeable to epicures, is made up of these little animals with their eggs and excrement), in flour, sugar, and on figs and sugared fruits; the *A. destructor* feeds upon the specimens of the entomologist and zoologist; the garden mites (*trombididae*) live upon fruits, flowers, and leaves; the spider mites (*gamasidae*) include the minute red spider of hothouses; and the wood mites (*oribatida*) creep among stones and moss.

MITFORD, MARY RUSSELL, an English authoress, born in Alresford, Hampshire, Dec. 16, 1786, died near Reading, Jan. 10, 1855. She was the daughter of a physician, a man of a singularly amiable temperament and engaging manners, but whose speculative tendencies early involved his family in ruin. Her education was chiefly acquired at a school in Chelsea, where she had for her governess out of school hours a Miss Rowden, who had previously taught Lady Caroline Lamb, and who afterward instructed Miss Landon and Fanny Kemble. At 20 years of age she published 8 volumes of poems, some of them long narratives in the style of Scott; they were roughly criticized by the "Quarterly Review." About 1812 she adopted literature as a profession, being prompted thereto by the embarrassed pecuniary circumstances of her father, and for several years was an industrious contributor of tales and sketches to the magazines and annuals. The example of Irving's "Sketch Book" first suggested to her the idea of writing sketches of the daily life of the rural population, and her most popular work is "Our Village," the scene of which is laid at the little hamlet of Three Mile Cross, near Reading. The sketches passing under this title, after having been refused admission to the "New Monthly Magazine," then edited by Thomas Campbell, were first published in the "Lady's Magazine" about 1820. The cheerful tone of kindness and domesticity pervading them, their mingled humor and pathos, and the simple and yet finished style in which they were written, insured them success; and the authoress extended her sketches to 5 volumes or series, the last of which appeared in 1832. In a similar vein was written "Belford Regis," for which the neighboring town of Reading supplied the materials. Among her other prose works were a volume of "Coun-

try Stories," which formed the 89th volume of the "Parlor Library," and several of the "Edinburgh Tales" published by Mrs. Johnstone in 1845. She also edited 3 volumes of "Stories of American Life by American Authors," and 4 of the annual volumes of Finden's "Tableaux." Her dramas, "Julian" (1828), "Foscari" (1826), "Rienzi" (1828), and "Charles the First," were performed with a considerable degree of success, "Rienzi" being on the whole the most popular. Her "Charles the First" was prohibited by George Colman, the licenser, for its supposed dangerous revolutionary sentiments, but was finally produced at the Coburg theatre in London. She also wrote several other dramas, which were never acted, and an opera, "Sadak and Kalasrade," the music of which was written by Packer. Among the closing events of her literary career was the publication of her "Recollections of a Literary Life" (3 vols. 12mo., 1852), a book "full of delightful reading, and furnishing the best illustrations of the writer's taste and character." Her last work was "Atherton and other Tales" (3 vols. 8vo., 1854). For upward of 40 years she lived in a little cottage in Berkshire, surrounded by the scenes so graphically described in "Our Village," the delight of the social circle in which she moved, and beloved by her rustic neighbors. About 3 years before her death an accident caused by the overturning of her pony chaise greatly enfeebled her, and the remainder of her life was passed in much physical suffering, but with characteristic cheerfulness.

MITFORD, WILLIAM, an English historian, born in London, Feb. 10, 1744, died in Hampshire, Feb. 8, 1827. He entered Queen's college, Oxford, where he proved a very indifferent scholar in every thing but Greek. Leaving the university without a degree, he studied for a while at the Middle Temple, but soon tired of the law, and abandoning the profession to his younger brother, who afterward became Lord Redesdale, retired to his ancestral estate in Hampshire, married, and devoted himself to literature. His early fondness for Greek led him to the study of the old historians of that nation; and with the advice of Gibbon, who was a fellow officer in the Hampshire militia, he resolved to undertake a history of Greece, the 1st volume of which appeared in 1784, and the 5th and last in 1818, bringing the narrative down to the death of Alexander the Great. Mr. Mitford was prevented by age and failing eyesight from carrying on the work, as he had intended, to the period of the Roman conquest. With considerable critical acumen and learned research, he succeeded in elucidating many obscure points, and until the publications of Thirlwall and Grote was esteemed the highest authority on the subjects of which he treats. His worst faults are a strong prejudice against democracy, which often distorts his judgments, lack of philosophic reflection, dulness of narrative, and cumbrousness of style. An edition of

his work by Lord Redesdale, with an introduction, appeared in 1829 (8 vols. 8vo.), and it has frequently been reprinted. Mr. Mitford also published a treatise on the religions of ancient Greece and Rome, as a supplement to his history; "An Inquiry into the Principles of Harmony in Languages and of the Mechanism of Verse, Modern and Ancient" (1774); and a "Treatise on the Military Force, and particularly the Militia, of this Kingdom." Beside commissions in the militia, he held several public offices, being county magistrate, verdurer of the New forest, and professor of ancient history in the royal academy. He was a member of parliament for Newport in Cornwall from 1785 to 1790, for Beeralston from 1796 to 1806, and for New Romney from 1812 to 1818.

MITHRA. See MYSTERIES.

MITHRIDATES, or MITHRADATES, a king of Pontus, the 6th of the name, surnamed EUPATOR and THE GREAT, born in 136, died in 63 B. C. He ascended the throne in 120. He subdued the barbarians between the Euxine and the Caspian, extended his conquests among the tribes beyond the Caucasus, rendered the Tauric Chersonese tributary, and on the demise of Parisades, king of the Bosphorus, annexed that country to his dominions. He next expelled the kings of Cappadocia and Bithynia, dependent allies of Rome, from their dominions, but the Romans promptly restored them. Nicomedes the Bithynian was not content with recovering his kingdom, but invaded the dominions of Mithridates, who, on failing to obtain redress from Rome, immediately commenced hostilities against her generals and allies. In 88 he again expelled the Cappadocian and Bithynian sovereigns, defeated the Roman armies that attempted to support them, made himself master of Phrygia and Galatia, overran the whole Roman province of Asia, and ordered all the Roman citizens found within its borders to be massacred; the victims of this decree are said to have numbered over 80,000. When these things were known at Rome, Sylla was appointed to command the armies sent against Mithridates, who transferred the seat of war to Greece, where his general Archelaus suffered two great defeats at Chæronea and Orchomenus in 86, while Mithridates was himself defeated in Asia by Fimbria. He was in consequence constrained to abandon his conquests in Asia, to pay an indemnity of 2,000 talents, and to surrender all his ships to the Romans (84). The events of what is called the second Mithridatic war are not of much interest; but the death of Nicomedes III., king of Bithynia, in 74 was the signal for the outbreak of the third. That monarch had bequeathed his dominions to the Roman people, and Bithynia was pronounced by the senate a Roman province. Mithridates refused to recognize it as such, and attempted by force of arms to place a pretended son of the deceased king on the throne. Entering Bithynia at the head of an army of over 120,000 foot and 16,000 horse, he vanquished the consul Cotta under the walls

of Chalcedon, and then proceeded to lay siege to Ozyzius; but he was eventually compelled by Lucullus, who had been appointed to the chief command in this war, to retreat with great loss into Pontus, whither his adversary presently pursued him. After completely defeating another vast army, Lucullus drove Mithridates from his kingdom. The subsequent mutiny of the Roman legions, however, enabled the indomitable oriental to recover Pontus. In 66 Lucullus was superseded by Pompey, and the war was resumed. Mithridates was surprised and totally defeated, and, to avoid captivity, plunged at the head of a handful of troops into the savage regions N. of the Euxine, and made his way to Panticapæum, the capital of the Cimmerian Bosphorus. Here he was safe from the Romans; but while he was planning schemes of aggression against Rome his son Pharnaces openly rebelled, and was proclaimed king by the soldiers and citizens. Mithridates, on learning this, took refuge in a strong tower, where, seeing no alternative save death or slavery, he sought to end his life by poison; but this proving ineffectual, he ordered one of his Gallic mercenaries to despatch him with his sword. It is said that to avoid being poisoned, to which he was much exposed during the vicissitudes of his career, he had accustomed himself to the use of antidotes to such a degree that the most baneful drugs had little effect on him. His son sent his body to Amisus as a peace offering to Pompey; but the Roman general caused it to be interred with regal honors in the sepulchre of the Pontic kings at Sinope. Mithridates possessed a powerful memory, was well acquainted with Greek literature, and understood more than 20 languages which were spoken in his dominions.

MITRE (Gr. *μῦρα*), an ornament worn upon the head by archbishops and bishops in the Roman Catholic and Greek churches, and also by abbots of certain orders. It consists of a stiff cleft cap, rising in two points, one before and the other behind, and having two ribbon-like pendants which fall upon the shoulders. It is often very richly adorned with gold and jewels. It was borrowed from the *mitnepheth* of the Jewish high priests, which was copied from the mitre made for Aaron (Exod. xxviii.). Upon the forefront of Aaron's mitre, over a blue lace, was a plate of pure gold, and graven upon it, "like the engravings of a signet, Holiness to the Lord." We find, however, in various nations of antiquity, caps resembling the modern mitre, from which the latter is sometimes thought to be derived. Bacchus was often represented with a mitre, from which the Greeks gave him the surname of *μυροφάρος*. The Persian deity Mithra appears with a similar head covering, and it has also been traced in India and Egypt. The mitre seems at one time to have been common to both sexes, and afterward restricted to women. It was worn by virgins who embraced a religious life in Africa in the 4th cent. and in Spain in the 8th, and

something which much resembles it is still in use by the women of Syria and Arabia. Concerning its adoption by Christian bishops there is great diversity of opinion. According to some Roman Catholic writers, it was not known in the West until the 10th century, though introduced much earlier into the East; but Martenne and others hold that it has always been a part of the episcopal costume, though in the early ages bishops did not wear it without special permission from the pope. From the time of Leo IX. (1049) until that of Innocent IV. the mitre was worn by cardinals, who exchanged it for the red hat at the council of Lyons in 1245. Mitred abbots are those who exercise quasi-episcopal authority over their monasteries. Their mitres differ from those of bishops, having the points at the sides instead of in front and behind.

MITSCHERLICH, ERNST, a German chemist, born in Neuende, near Jever, in the grand duchy of Oldenburg, Jan. 7, 1794. He studied at the gymnasium of Jever, where his teacher, the historian Schlosser, excited his interest in oriental history and philology. He pursued his studies especially in this department at the university of Heidelberg (1811), in Paris (1813), and in Göttingen (1814), where he published the first part of a work on a tribe of the East, entitled *Mirchondi Historia Thaheridarum* (1815). Meantime he had turned his attention to the natural sciences, and in 1818 he went to Berlin to devote himself particularly to chemistry. There he discovered the law of isomorphism, the importance of which and the genius of the young chemist were at once discerned by Berzelius on a visit to Berlin in 1819. At his invitation Mitscherlich accompanied him to Stockholm, and passed two years in his laboratory. On his return to Berlin, he became the successor of Klaproth in the academy of sciences and in the chair of chemistry in the university. His first results in the discovery of isomorphism were presented to the Berlin academy in 1819, and in the following year they were generally known and accepted by chemists. His theory treats of the relation between the crystalline form and the atomic elements of substances. He found that bodies of wholly different chemical composition crystallize into cubes, octahedrons, or other forms that entirely coincide in their angular measurements; that their respective elements may supplant each other in compounds without change of the crystalline form; and he therefore inferred that the latter does not depend upon the chemical nature of atoms, but only upon their number and the order in which they are grouped. The bodies which have elements thus chemically unlike but mechanically similar are termed isomorphous. This view of the molecular constitution of bodies, which is one of the most important principles in theoretical chemistry, was not only stated, but has been developed by him in a long series of observations, memoirs of which have appeared in scientific publications. It gave new chemical significance to crystallography, and introduced

a thorough reform into the classification of minerals from a chemical point of view. In 1823 he completed the theory by the discovery that some substances, as sulphur and carbon, under different circumstances, crystallize in two dissimilar forms. Such bodies are termed dimorphous. The reports of his investigations and discoveries are chiefly contained in a large number of papers in the *Abhandlungen* of the Berlin academy and in the *Annalen* of Poggendorf. He has also published a *Lehrbuch der Chemie* (Berlin, 1829-'40; 5th ed., 1858), remarkable for precision and elegance of style, and specially designed to withdraw students from the extreme synthetical tendencies of Schelling's philosophy of nature, and to make them exact and cautious observers. His university lectures had the same object in view, and the illustrative experiments were made with so simple an apparatus that they could be easily repeated privately by the students. He also perfected the instruments for measuring the angles of crystals, and by the aid of a new goniometer answered an objection which had been raised against the isomorphism of crystals from the occasional inequality of the corresponding angles. He proved that such anomalies are not rare even in crystals of the same chemical composition. His researches have extended to the influence of heat on crystallization, have proved the identity of natural and artificial crystals, have obtained important results with reference to the identity or analogy of organic and inorganic substances, and by observing the melting point of rocks have furnished valuable elements to geognosy. Many instruments of his invention have been generally adopted in Germany and other countries; his discovery of isomorphism was rewarded by the gold medal of the royal society of London; and he is one of the few foreign associate members of the Institute of France.

MITTAU. See MITAU.

MITTERMAIER, KARL JOSEPH ANTON, a German jurist and statesman, born in Munich, Aug. 5, 1787. He studied at Landshut and Heidelberg, officiated for many years as professor in the former university, and in 1819 removed to Bonn. In 1821 he was invited to fill the chair of jurisprudence at Heidelberg, and, with the exception of occasional absences, he has since presided there over that branch of study; and by his teaching as well as by his writings he has gained the reputation of one of the ablest jurists of the age. He has always been an advocate of the utmost publicity in the administration of justice, an unflinching opponent of the secret mode of judicial proceedings which prevailed in Germany until 1848, and of the unlimited, absolute, and tyrannical power of the so called *Inquisitions-Process*. He is one of the staunchest defenders of the trial by jury in Germany, and was one of the first and few jurists who took deep interest in the science of punishment, not limiting his interest to the criminal trial or penal code. His reformatory activity embraced chiefly the common, civil, and criminal

law of his native country, and the theory of trials as well as punishment. With Thiebaud and other jurists, Mittermaier defended (theoretically) the codification of the French civil law against the attacks of Hugo, Savigny, and other scholars of the Roman law. His *Lehrbuch des Deutschen Privatrechts* (1821) was subsequently merged in his *Grundsätze des gemeinen Deutschen Privatrechts* (3 vols., Ratisbon, 1837-'8). The laws on commercial matters, on bills of exchange, and on maritime affairs are fully expounded in the later editions of this work, which is regarded as a standard authority. His first work on criminal law, *Handbuch des peinlichen Processes* (2 vols., Heidelberg, 1810-'12), was afterward republished in an enlarged and modified form under the title of *Das Deutsche Strafverfahren in der Fortbildung durch Gerichtesgebrauch und Particulargesetzgebung* (3 vols., 1832), and has passed through many editions. The principles upon which the examination of witnesses in criminal law should be based are discussed in his *Theorie des Beweises im peinlichen Prozesse* (2 vols., Darmstadt, 1821), in *Die Lehre vom Beweise im Deutschen Straf-Process* (Darmstadt, 1834; French translation, Paris, 1848; Spanish, Madrid, 1851), and in his *Anleitung zur Vertheidigungskunst im Criminalprocess* (translated into Italian by Garba, Milan and Verona, 1858), which is a work of great importance for practitioners at the German bars. He has prepared a complete manual of criminal law (*Lehrbuch des Criminalprocesses*) upon the basis of Feuerbach's great work, which has reached upward of 12 editions. Several of his works treat of the progress in the administration of criminal law, as *Ueber den neuesten Zustand der Criminalgesetzgebung* (Heidelberg, 1825); *Ueber die Grundfehler der Behandlung des Criminalrechts in Lehr- und Strafgesetzbüchern* (Bonn, 1819); *Die Strafgesetzgebung in ihrer Fortbildung geprüft* (Heidelberg, 1841-'8); and various changes in the administration of the law are further recorded in the periodicals published under his direction. His most comprehensive work on the theory of trials, or on the principles upon which they should be conducted, is entitled *Der gemeine Deutsche bürgerliche Process, in Vergleichung mit dem Preussischen und Französischen Civilverfahren und mit den neuesten Fortschritten der Civilgesetzgebung* (1820-'26). His work, *Die Mündlichkeit, das Anklageprincip, die Öffentlichkeit und das Geschworenengericht* (Stuttgart, 1845), brings the learned investigation and the legislative enactments on all the various branches of the subject of public trial by jury down to the period of its publication; and his *Das Englische, Schottische und Nordamerikanische Strafverfahren* (Erlangen, 1851), treats of the administration of justice in England, Scotland, and the United States. His work on prison reform published in 1858 was followed in 1860 by *Der gegenwärtige Zustand der Gefängnisfrage, &c.*—In politics Mittermaier is in favor of liberal institutions, but he cannot be classed

among the more radical German statesmen. He was a member of the Baden legislature for nearly 20 years previous to 1841, when his grief at the death of his son caused him to withdraw from that body. During that time he had officiated three times as its president; and having resumed his seat there in 1846, he was again invested with that dignity during the session of 1847-'8. In 1848 he was first called upon to preside over the provisional parliament (*Vor-Parlament*) at Frankfort; and being afterward chosen to the German parliament as a representative of Baden, he took an active part in the preliminary labors in regard to a new constitution for Germany, and advocated the establishment of a confederacy of German states, but opposed all arbitrary and illegal proceedings. In April, 1849, he returned to Heidelberg; and although he occasionally visited Frankfort during the short remainder of the existence of the German parliament, he has since devoted himself exclusively to his academical duties and to his writings on jurisprudence. Although his hopes for the political regeneration of Germany were baffled by the reactionary spirit which has since prevailed, his legislative activity has at least enabled him to carry out many of the judicial reforms which he had advocated in his writings; and his readiness as a speaker, as well as his sympathy with liberal measures, has given him somewhat the reputation of a German Brougham. He has repeatedly visited Italy, and embodied the result of his observations in a work entitled *Italianische Zustände* (Heidelberg, 1844). He has prepared a German translation, with annotations, of Dr. Lieber's "Letter on Anglican and Gallican Liberty;" and superintended his son's translation of the same author's work on "Civil Liberty" (1860). Like Humboldt, Mittermaier has always placed a noble confidence in the spirit of the rising generation, and repeatedly told his disciples in his lectures, that his whole happiness consists in thinking that most of his youthful hearers will surpass him, their professor, in learning and conscientiousness, and in assisting humanity in its progress toward truth and justice. No European writer is so familiar with American legislation or takes so deep an interest in it. He has also repeatedly visited England and Scotland to study the laws and trials of those countries. His many works and countless essays show that he has his eyes on the legislation of every civilized country, of Portugal and Spain as well as of Sweden and Norway, and every truly liberal or humane movement has through his long life found a ready response in his heart. In 1859 he celebrated his jubilee as public teacher, when he received the most distinguished acknowledgments from almost all parts of Europe.

MITTIMUS, in law, the name of the precept which is addressed by competent judicial authority to a sheriff, constable, or other officer, and to a gaoler or keeper of a prison, commanding them respectively to take and deliver, or to receive into custody and safely keep, a person

charged with the offence named therein, until he is delivered by due course of law. This last clause must not, however, be inserted when the commitment is in the nature of punishment, in which case the time of imprisonment must be stated in its stead; and in the case of a commitment for a bailable offence, the direction is to keep the prisoner in custody "for want of sureties or until he shall be discharged by due course of law." A magistrate may by this precept order a party into custody, when upon examination he is satisfied that the accused is guilty of the offence charged against him, or even when he has good reasons to suspect that he committed it. Though the mittimus need not be drawn with the utmost technical nicety, yet it must be framed with reasonable certainty. It must, at all events, show on its face a charge of a criminal nature. It generally runs in the name of the justice who awards it, though sometimes it is framed in the name of the people. It usually bears the hand and seal of the magistrate who issues it, and discloses the time and place of making it. The prisoner should be described by his name, if that be known; but if he refuse to give it, that fact must be set forth together with a general description of his person. It is not necessary to recite in the warrant either the evidence or the grounds upon which the accused is committed, though it is proper to state that the commitment was made upon a sworn complaint. In New York and Massachusetts, and probably in other states, it is the usual practice to recite in the mittimus the complaint upon which it is founded. It is essential to the validity of the mittimus, that it contain the allegation of a criminal offence; without it, the accused might claim his discharge upon *habeas corpus*. It is important, too, that the particular offence be averred with reasonable certainty. In England it has been held, in a case of imprisonment upon conviction, that where the mittimus alleged a different offence from that upon which the party was found guilty, the magistrate who issued it was liable to an action for a false imprisonment. If an offence be created by statute, the particular language which describes it must be repeated in the mittimus; and as matter of essential form, the description must include the usual words, "contrary to the form of the statute in such cases made and provided." Yet the law will not permit justice to be defeated by a requirement of undue niceness. This was the disposition of the court in New York when it decided that, though upon a defective commitment it must in strictness discharge the prisoner, yet it would do so only *pro forma*, and remand him upon a special order of the court, if there appeared to be probable cause for his detention; and in some states, as in Illinois and Georgia, statutes have expressly provided that no one shall be released for a defect of legal precision or a want of technical form, provided enough appear on the face of the warrant to ascertain the crime for which the party was

imprisoned. So, by statutes, various requirements are made of the magistrate who issues the precept; as, for example, that he write upon it the names and residences of the witnesses in the case, or the amount of bail required.—The gaoler is bound to receive the prisoner, and may be indicted if he refuse to do so. But if he do refuse, the officer to whose custody the accused is committed may himself keep him, until the gaoler consents or is compelled to perform the duty of his office. A constable should take a copy of the warrant and also a receipt for his prisoner from the gaoler. The mittimus is to be handed over to the latter; it is his authority for detaining the accused.

MITYLENE, **MYTILENE**, **METELIN**, or **MIDUL-LU** (anc. *Lesbos*), an island of the Grecian archipelago, belonging to Turkey, about 7 m. from the coast of Asia Minor, lying chiefly between lat. 39° and 39° 20' N. and long. 25° 50' and 26° 40' E.; length about 45 m., greatest breadth 30 m.; area, 276 sq. m.; pop. 40,000, mostly Turks. On the S. it is indented by two deep bays called Ports Culoni and Lero, the former of which extends to the centre of the island. Both have very narrow mouths, and expand as they stretch inland. The surface is diversified by wooded hills and beautiful plains; the soil is fruitful, and the climate is salubrious. The principal products are olives, wine, fruit, silk, cotton, and pitch; but the imperfect means of irrigation are a great impediment to agriculture. Castro, or Mitylene (anc. *Mytilene*), on the E. coast, Culoni, and Moliwo are the chief towns.—The ancient Lesbos was one of the islands of the Æolians, and at a very early period contained several rich and populous cities, of which Mytilene and Methymna were the most renowned. The Lesbians joined the revolt of the Ionians under Aristagoras, about 500 B. C., and were in consequence hunted down by the Persians; and in the Peloponnesian war they took the side of Lacedæmon, in punishment for which their lands were divided among a number of Athenian citizens. In the 1st century B. C. the island was under the dominion of Mithridates, and after his defeat was annexed to the possessions of Rome. It was the birthplace of the poets Terpander, Arion, Alcæus, and Sappho (being thus the home of the Æolian school of lyric poetry), of the philosophers Pittacus, Cratippus, and Theophrastus, and the historians Hellanicus and Theophraneas. In the modern Greek struggle for independence it suffered greatly, and lost nearly half its inhabitants.

MNEMONICS (Gr. *μνημη*, memory), the art of rendering artificial aid to the memory. According to Cicero, the first person who suggested a system for this purpose was the poet Simonides of Cos (about 500 B. C.), who was called from a banquet just before the roof of the house fell in and crushed all the rest of the company. On returning he found the bodies so mutilated that no individual could be recognized; but by remembering the places which they had severally occupied at table he was able to distin-

guish them. He was thus led to remark that the order of places may by association suggest the order of things. Cicero and Quintilian both advocated and developed this plan of topical memory, of associating thoughts and words with particular places, images, or signs which might be recalled at pleasure. One of the earliest modern works on the subject is the *Fania* (1491) of Petrus Ravennas, professor of canon law in Padua. One of his artifices, in the arrangement of symbolical places and images, was to make the most beautiful maidens the letters of a mnemonic alphabet, which according to his experience had a powerful effect in exciting the memory. He would repeat verbatim all the sermons that had been preached during a whole season of Lent, would remember every cast and move in games of dice and chess that were played at the same time, and under the head of 19 letters of his alphabet he preserved ready for quotation 20,000 passages of civil and canon law, 7,000 of Scripture, 1,000 of Ovid, and many others from various authors. John Romberch de Krypse, in his *Congestorium Artificioea Memoria* (1588), recommended the division of the walls of a series of rooms into separate spaces, each of which was to be marked with numerical, literal, and symbolical alphabets. Thus in learning grammar, a naked man was to personate the singular number, and each of the cases was to be placed on a particular part of his body. A clothed man personated the plural, with a similar disposition of the cases. The distinct rooms were to be devoted, like the alcoves of a library, to distinct classes of subjects; and the nomenclature having once been mastered, the suggestions of local relation would enable a man to repeat hundreds of words or ideas that had no real connection with each other. The same method is developed further in the "Castel of Memory" of Gulielmus Gratarolus of Bergamo, published in English in 1562. The *Ars Memoria* of Marafortius (1602) grouped all necessary reminiscences around 44 images contained in the palms of the two hands. Baptista Porta, in his *Ars Reminiscendi* (1602), seems to have first employed the mode of writing now common in rebuses. About 1609 Lambert Schenkel astonished all classes in France, Germany, and the Netherlands by his mnemonic performances. Twenty-five Latin sentences were dictated to him and numbered, and after twice reading them aloud he was able to repeat them backward as well as forward, to give the number of each, or to give the sentence of any number that was required. Some of his pupils would answer in the same way concerning 200 sentences. The system was obscurely explained in his *Gasophylacium Artis Memoria* (1610). More elaborate than any preceding scheme was the repository for ideas suggested by John Wallis in his *Mnemoniaca* (1618). This repository was to be a series of imaginary theatre-shaped edifices, with their interior walls variously divided and colored. Every person was to have this repository constantly present before

his mind, within which all his ideas were to be arranged according to their qualities, quantities, positions, and colors. The management of such a mnemonic vehicle would seem to be as severe a task as the direct remembrance of all its contents. The plan only became more complicated as improved by Henry Herdson (1651). The *Memoria Technica* of Grey (1780) contains a system which many persons have found of use in the study of history and science in remembering dates and numbers. The letters are substituted for figures and combined into words, the vowels however being of no value, and serving only to connect the consonants. Harmonious words may thus be formed, which are more easily remembered than the numbers which they represent. The most complicated system of mnemonics is that of Feinagle, who began to lecture in Paris in 1807 and in England in 1811. He divides the walls, ceiling, and floor of a room into 50 imaginary equal compartments. To each compartment is assigned a particular hieroglyphic, with which it is indelibly associated. These elements having been thoroughly mastered, some association, no matter how ridiculous, is formed between the object to be remembered and one of the hieroglyphs. The substitution of letters for figures also belongs to his system, and the memory of events, characters, and dates is combined. Thus a willow tree on the hieroglyph of the tower of Babel, with a piece of dead laurel hanging from it, suggests William the Conqueror. Willow stands for William; the tower of Babel, being the first hieroglyph, makes it William I.; the laurel gives the epithet of the conqueror; and the consonants in "dead" represent 66, which, with the 1,000 understood through the series, gives 1066, the date of the conquest. A simpler system was taught in the United States by F. Gouraud, who published an "Art of Memory," and "Mnemonic Dictionary" (New York, 1845). Among the more recent professors of mnemonics, Gen. Bem and the Dane, Reventlow, now a resident of the United States, deserve mention.

MNEMOSYNE (Gr.), in classical mythology, the goddess of memory, one of the Titanides, daughter of Uranus, who became by Jupiter the mother of the Muses.

MOAB, an ancient people of Syria, who lived in the region E. of the Dead sea and the Jordan, between the Ammonites and the Edomites. They are derived in Scripture from Moab, a son of Lot. They were a pastoral people, the valleys and slopes of their mountainous regions being well adapted for grazing. They also produced wine and corn. The capital was Ar or Rabbath-Moab, S. of the Arnon. Before the exodus of the Hebrews from Egypt, the Moabites had conquered their possessions from a gigantic tribe called Emim, but subsequently lost the portion of them between the Jabbok on the N. and the Arnon on the S. to the Amorites, from whom it was conquered by Moses and divided between the tribes of Gail and Reuben. The king of Moab vainly sought help from Balaam

against the Hebrews, but suffered no attack on his possessions. The hostility between the two new neighbors, however, was almost continual, and mutual oppression was frequently exercised. In a general insurrection, Ehud, having assassinated the Moabite king, shook off the yoke which had long pressed upon his people. A time of peace followed. Saul waged war against Moab, and David finally made them tributary. After the division of the Hebrew state, they revolted against Ahab, king of Israel, whose son Jehoram tried in vain to reconquer their territory. They subsequently made various incursions into the Hebrew possessions, and appear in later times to have re-occupied the land between the Jabbok and Arnon, probably after the exile of the 10 tribes, and they also assisted the Babylonians in their invasion of Palestine. But they, too, were subdued by the conquerors. Like those of Ammon and Edom, their name was finally lost under that of the Arabians. Their licentious and bloody idolatry of Baal-Peor and Chemosh made them an object of national detestation to the Hebrews, no less than their frequent hostilities, and they are often contemptuously spoken of in the prophets.

MOBILE, a S. W. co. of Ala., bounded E. by Mobile river and bay, S. by the gulf of Mexico, and W. by Mississippi; area, nearly 1,400 sq. m.; pop. in 1855, 29,775, of whom 8,857 were slaves, and 1,041 free persons of color, the latter consisting mainly of colored creoles, the citizens and their descendants of the Spanish colony at the time of its cession in 1813, still exercising certain privileges of citizenship secured to them by treaty. The surface is generally uneven, except in that portion bordering on the bay and gulf, and the soil is sandy and poor, mainly covered with forests of pine. It has many streams of pure water, and, except on the low borders of the river, is very healthful. The productions in 1850 were 34,500 bushels of Indian corn, 44,720 of potatoes, and 90,409 lbs. of rice. There were 12 saw mills, 2 grist mills, 2 iron foundries, 19 churches, and 1,774 pupils attending public schools. The city of Mobile, the capital, is in the E. part of the county, about midway between its N. and S. limits. In the N. E. portion, on the river Mobile, is the site of Fort Stoddard, an important military post previous to 1813, when the country S. of lat. 31° N. was in possession of Spain. It was here that the customs of the United States were collected during that period. It is memorable also as the place to which Aaron Burr was taken for safe keeping in 1807, after his arrest, which occurred in the vicinity. Near the site of Fort Stoddard is the Mount Vernon arsenal of the United States, on an elevated, secluded, and picturesque spot, about 2 m. from the river. In the N. W. part of the county, 38 m. from Mobile, and on the Mobile and Ohio railroad, is the village of Citronelle. Spring Hill, the seat of a Roman Catholic college, is about 6 m. W. from Mobile. A few miles S. of the mainland, in the

gulf of Mexico, immediately W. of the entrance of Mobile bay, and forming a part of the county, is Dauphine island, memorable as the seat of one of the first French settlements, established there by Bienville in 1702. It was originally called Massacre island, from the number of human bones found upon it, and still bore this name until a very recent period in the colloquial usage of the creole inhabitants. For a number of years it was at intervals the seat of government of the colony of Louisiana; and it has been more than once the scene of contest in the various wars in which France, Spain, Great Britain, and the United States have been involved, beside having been once or twice plundered by buccaneers. At present it is only inhabited by a few poor families, beside the persons employed in the construction of Fort Gaines, a work in process of erection on the E. extremity of the island, for the defence of the entrance to Mobile bay. Petit Bois island, which lies further W., was originally a part of Dauphine island, but was separated from it by a great hurricane about the year 1777. It is now entirely uninhabited.—That portion of the county S. of lat. 31°, together with the corresponding portion of what is now Baldwin co., being originally part of the French colony of Louisiana, was ceded to Great Britain in 1763. In 1783 it passed into the possession of Spain, simultaneously with the retrocession of Florida to that power by Great Britain. It continued in the possession of Spain until 1818, when it was seized by the United States, which had claimed it for 10 years previous, as a part of the Louisiana purchase. The right of Spain, however, was not formally relinquished until the treaty of 1819. Mobile co. (including the city) has a special public school system of its own, which has been in operation, with considerable success, since 1852.

MOBILE, the principal city and only seaport of Alabama, situated on the W. side of Mobile river, immediately above its entrance into the bay of the same name, in lat. 30° 41' 26" N., long. 88° 1' 29" W.; pop. in 1850, 20,515; in 1860, about 30,000. The corporate limits extend 6 m. N. and S., and 2 or 3 m. W. from the river. The thickly inhabited part of the city, however, extends for about a mile along the river, and nearly the same distance back to the westward. The site of the city is a sandy plain, gradually rising as it recedes from the water. The streets are generally regular, well paved, and shaded. There are several fine public buildings, among which is a handsome market house with rooms for the municipal officers in the upper story. The custom house has also accommodations for the post office and U. S. courts. Among the other noticeable buildings are the theatre, Odd Fellows' and temperance halls, guard house and tower, and the Barton academy, occupied by the public schools. There are 2 banks, a savings bank, 28 churches (3 Baptist, 1 Bethel, 4 Episcopal, 8 Methodist, 4 Presbyterian, and 8 Roman Catholic, including

a fine cathedral now [1860] nearly completed), a Jewish synagogue, 8 orphan asylums, an infirmary conducted by the sisters of charity, a city and a marine hospital, several other benevolent institutions, and a literary society with a good library. A medical college was founded in 1859, and has a spacious edifice in course of erection. The suburban villages of Turner-ville, Toulminville, Jacksonville, Summerville, Spring Hill, Cottage Hill, &c., near the city, are well supplied with churches and schools. St. Joseph's college at Spring Hill, and the academy of the Visitation (for girls) in Summerville, are flourishing institutions under Roman Catholic control. There are many handsome villas and cottages in the suburbs and environs. Mobile is lighted with gas, and supplied with water of unusual purity and excellence, which is brought a little more than 5 m., from the foot of Spring hill. The construction of the Mobile and Ohio railroad, which is to connect Mobile with Cairo, at the mouth of the Ohio river, and is now (1860) approaching completion, promises to give fresh impetus to its trade. The Mobile and great northern road, also in active progress, will connect it with Montgomery and the roads leading thence to all parts of the eastern states. Several city and neighborhood railroads are about to be constructed. Among the industrial establishments are 2 iron founderies, a rosin oil factory, several ship yards, a dry dock, and a great number of cotton presses. The exports of cotton from the port of Mobile for a period of 5 years, each ending Aug. 31, have been as follows: 1855-'6, 680,657; 1856-'7, 495,360; 1857-'8, 515,371; 1858-'9, 681,094; 1859-'60, 789,057; average of the 5 years, 682,808 bales. The other exports consist only of lumber, turpentine, rosin oil, &c., and are small in comparison with the amount and value of the cotton. The whole value of exports and imports for 5 years, ending Dec. 31, was as follows:

| Years. | Exports. | Imports. |
|--------------|--------------|-----------|
| 1855..... | \$16,818,005 | \$441,529 |
| 1856..... | 19,917,884 | 934,889 |
| 1857..... | 21,582,496 | 568,917 |
| 1858..... | 28,553,736 | 684,696 |
| 1859..... | 80,079,711 | 982,140 |
| Average..... | \$28,419,266 | \$711,420 |

The trade of Mobile is much hindered by lack of a sufficient depth of water in its harbor. Vessels drawing more than 8 or 10 feet are obliged to anchor in the bay, at a distance of some 25 m. or more from the city, and receive their cargoes by the aid of steamers that ply between the city and the anchorage. By a recent act of the Alabama legislature a board of commissioners has been created, with authority to take measures for deepening the harbor.—The climate of Mobile, although debilitating in summer to some constitutions, is generally healthful, except for occasional visitations, at irregular intervals, of epidemic yellow fever. The following are the seasons in which these visitations have occurred, within a quarter

of a century: 1837, 1839, 1843, 1847, 1853, and 1858. The epidemics of 1839 and 1853 were the most fatal. In 1853, between Aug. 1 and Oct. 26, there were 1,256 deaths, of which 1,072 were attributed to yellow fever, being supposed to be equivalent to about one tenth of the population actually resident and remaining within the city during the epidemic. Mobile, however, enjoys the advantage of having high and healthful hills within a few miles N., W., and S. W. of the city, which afford permanent or summer residences.—Mobile was the original seat of French colonization in the South West, and for many years the capital of the colony of Louisiana. In 1702, Lemoine de Bienville, acting under the instructions of his brother Iberville, transferred the principal seat of the colony from Biloxi, where it had been established 3 years previously, to a point on the river Mobile supposed to be about 20 m. above the present site of the city, where he established a fort to which he gave the name of St. Louis de la Mobile. At the same time he built a fort and warehouse on Isle Dauphine, at the entrance of Mobile bay. The settlement at Biloxi was soon afterward broken up. In 1704 there was an arrival of 20 young girls from France, and the next year of 23 others, selected and sent out under the auspices of the bishop of Quebec, as wives for the colonists, beside a considerable accession of soldiers for the garrison. Many of the original settlers were Canadians, like Iberville and Bienville. In 1705 occurred a severe epidemic—supposed to be the first recorded visitation of yellow fever—by which 35 persons were carried off. The year 1706 is noted for the “petticoat insurrection,” which was a threatened rebellion of the females in consequence of dissatisfaction with the diet of Indian corn to which they were reduced. The colony, meanwhile, frequently suffered from famine, as well as from the attacks of Indians, although relieved by occasional supplies sent from the mother country. In 1711 the settlement was nearly destroyed by a hurricane and flood, in consequence of which it was removed to its present situation. In 1712 the king of France made a grant of the whole colony to Antoine Crozat, a wealthy French merchant, and in the following year Bienville was superseded as governor by M. de la Motte Cadillac. In 1717 Crozat relinquished his grant to the French government, and Bienville was reinstated. In 1723 the seat of the colonial government was transferred to New Orleans. In 1763, by the treaty of Paris, Mobile, with all that portion of Louisiana lying E. of the Mississippi and N. of Bayou Iberville, Lakes Maurepas and Pontchartrain, passed into the possession of Great Britain. In 1780 the fort—the name of which had been changed to Fort Condé, and subsequently by the British to Fort Charlotte—was captured by the Spanish general Don Galvez, and in 1783 its occupancy was confirmed to Spain by the cession to that power of all the British possessions on the gulf of Mexico. On April 18, 1813, the

Spanish commandant, Cayetano Perez, surrendered the fort and town to Gen. Wilkinson, since which time it has continued in possession of the United States. At that period the population, which in 1785 had amounted to 746, was estimated at only 500 (exclusive of the garrison), half of whom were blacks. In Dec. 1819, Mobile was incorporated as a city.

MOBILE, the name of a river and bay in the southern part of Alabama, derived from that of a tribe of Indians (the Mauvilians, or Mobilians) who inhabited the adjacent country at the time of its first settlement by Europeans. The river Mobile is formed by the confluence of the Alabama and Tombigbee. A few miles below this point it divides into two branches, the eastern one of which takes the name of Tensas, the western retaining that of Mobile. Before reuniting, both these streams separate into several other subdivisions, all of which meet in one common embouchure, at the head of Mobile bay. The length of the Mobile river is about 50 m., and its general direction is south. In the lower part of its course the banks are marshy and alluvial.—The bay of Mobile is about 30 m. in length from N. to S., with a general width of 10 or 12 m., except where it expands, on the S. E., into the subsidiary bay of Bon Secours, which extends some 8 or 10 m. further to the eastward. The entrance from the gulf of Mexico, between Mobile point on the E. and Dauphine island on the W., is about 8 m. wide, and is commanded by Fort Morgan on Mobile point, and Fort Gaines (yet unfinished) on Dauphine island. The bay has another outlet on the S. W. through Grant's pass, N. of Dauphine island, which communicates with Mississippi sound. Through this channel steamers and other vessels of light draught generally pass when plying between Mobile and New Orleans. The bar in front of the main entrance of the bay admits of the passage of vessels drawing 21 or 22 feet. The ordinary anchorage for ships is 4 or 5 m. within the entrance of the bay. The whole of the upper portion of the bay is shallow, and is supposed to be gradually filling up with sedimentary deposits from the rivers that flow into it. Measures are now (1860) in progress, however, for the opening of a channel for ships to the city of Mobile. There is a revolving light on Mobile point; a fixed light on Sand island, 8 m. S., and immediately in front of the entrance, and another on Choctaw point, at the head of the bay, a little below the city of Mobile.

MOBILE POINT, the apex of a long, low, narrow, sandy peninsula between the gulf of Mexico on the south, and Bon Secours bay and Navy cove on the north. The point is the eastern limit of the entrance into Mobile bay. It is the site of Fort Morgan, a work constructed at an expense of about \$1,250,000. Fort Morgan is built on the site of Fort Bowyer, famous for the repulse of an attack by the British, Sept. 14, 1814. The fort, which was very imperfectly constructed, was commanded by Major Lawrence, with a garrison of only 130, includ-

ing men and officers, and 20 pieces of artillery. It was attacked by a squadron of 2 sloops of war and 2 brigs, assisted by 600 Indians on land, with whom were associated 180 marines from the ships. The attack continued for 8 hours, when the enemy were repulsed, with the loss of the *Hermes*, Commodore Percy's flag ship, which ran aground and was burned, and 282 men killed and wounded. Eight of the garrison were killed. After the battle of New Orleans, Fort Bowyer was again invested by the whole British force, to which Lawrence surrendered, Feb. 12, 1815.

MOBILIER, CRÉDIT. See CREDIT MOBILIER.

MOOANNA, or MOKANNA. See ATHA BEN HAKIM.

MOOHA, or MOKHA, the principal seaport town of Arabia, in the province of Yemen, on the Red sea, 40 m. N. N. W. from the straits of Bab-el-Mandeb; lat. $13^{\circ} 20' N.$, long. $43^{\circ} 20' E.$; pop. about 7,000. It extends N. and S. along the shore for about $1\frac{1}{2}$ m. The houses are generally built of stone, are lofty, adorned with stucco ornaments, and brilliantly white. The chief public edifices are the mosques, one of which is of great magnitude. Mocha is the principal port and emporium of the dominions of the imam of Sana, and owes its importance to the coffee for which it is celebrated, and which is brought thither from the interior. Although the export of Mocha coffee has much declined, it is still said to average about 10,000 tons yearly. The bay is formed by two promontories, at the extremity of each of which a fort has been erected for the protection of commerce, but vessels drawing over 10 or 12 feet of water must anchor outside.

MOCHUANA. See BROHUANA.

MOCKING BIRD, an American passerine bird, of the sub-family *mimina*, and genus *mimus* (Boie). The sub-family includes the catbird, brown thrush, and nearly 20 other mockers, arranged by Gray under the single genus *mimus*, but subdivided by Cabanis and others into nearly as many genera as species. The restricted genus *mimus* has the bill shorter than the head, slightly curved from the base, and notched at the tip; the gape furnished with bristles; lower jaw with no longitudinal ridges; wings moderate and rounded, with the 1st quill very short, the 2d longer, and from the 3d to the 7th nearly equal and longest; tail long and graduated; tarsi longer than the middle toe, robust, and covered in front with broad scales; toes long, with sharp curved claws. The size is large, and the general appearance thrush-like. The species of this genus are found in North and South America, the West Indies, and the Galapagos islands; they are shy, active, and migratory, feeding on insects, berries, and worms; the song is highly pleasing, and the powers of imitation very great. The common mocking bird (*M. polyglottus*, Boie) is about 9½ inches long, with an extent of wings of 13½; the bill and legs are black; the general color above is ashy brown, a little the darkest in the

centre; the under parts white, with a brownish tinge except on the chin, and a shade of ash across the breast; a pale superciliary stripe; wings and tail nearly black; lesser wing coverts like the back, the middle and greater tipped with white, forming 2 bands; outer tail feather white, the 2d mostly so, the 3d with a white spot on the end, and the rest, except the middle, slightly tipped with white. It is found in the southern United States, from the Atlantic to the high central plains, replaced by the *M. montanus* (Bonap.) to the westward. The song of the mocking bird is regarded as superior to that of the nightingale by those who have heard both; in its mellowness, modulations and gradations, extent of compass, and brilliancy of execution, it is unrivalled. Audubon considers it absurd to compare the best notes of the nightingale "to the finished talent of the mocking bird." Its powers of imitation are such that to a blind man it would seem that the whole feathered tribe had assembled to try their skill in song, when it chooses to exercise this faculty; it can adapt its tongue to any note, from the feeble chirp of the chicken to the scream of a hawk; it deceives the sportsman, cheats and terrifies birds, whistles to the dog, and imitates almost every sound, animate or inanimate. Like the nightingale, it sings charmingly at night, commencing as soon as the moon rises. In captivity its habits are very amusing, from its imitating various household noises. Its finest song is during the breeding season. It delights to build a nest in gardens near houses; the eggs are usually 5, light green with brown spots and blotches; they begin to pair toward the end of March, and 8 broods are generally raised between that and the last of September. They remain in the gulf states all the year; some go to the north in the spring, returning in October; they are most plentiful near the sea shore, in sandy districts scantily furnished with trees. From the low position of the nest, snakes and cats often climb the trees and devour the eggs and young; but they are generally protected by man, for their sociable habits and pleasing song; in winter they live principally about the farm houses and plantations. Their motions on the ground are light and elegant, accompanied by frequent openings of the wings and tail; the flight is short and jerking. The call note is very mournful, like that of the *M. rufus* (Boie), the French mocking bird so called, which Audubon terms its first cousin. Its courage is great, sufficient to defend it against most birds of prey. It is easily reared by hand from the nest, and becomes very familiar and affectionate in confinement; its vocal powers, though great in captivity, are very much greater in its native haunts; it is long-lived, and a good singer always commands a high price. The female differs little from the male, but the plumage is somewhat duller. The *M. carolinensis* (Gray) has been described under CATBIRD, and is a skilful mocker. Other species are described in South America, and on the Pacific coast of

North America, all possessing remarkable powers of song.

MODENA, a state of N. Italy, bounded N. by Mantua, E. by Ferrara and Bologna, S. by the Mediterranean, and W. by Genoa and Parma; area, about 2,800 sq. m.; pop. in 1858, 604,512, all Roman Catholics excepting about 200 Protestants and nearly 3,000 Jews. It comprises 6 divisions, viz.: Modena proper, pop. 212,818; Reggio, 167,547; Guastalla, 76,815; Frignano, 88,418; Garfagnana, 50,872; Massa Carrara and Lunigiana, 58,757. The last 2 divisions lie S. of the Apennines, the main ridge of which crosses the southern portion of the state, sending off spurs over a large extent of country. The highest summits are Monte Cimone and Campoazghena, estimated respectively at 7,000 and 6,500 feet. The territory of Modena extends from the Po to the Mediterranean, but the portion of sea coast is small and destitute of harbors. About $\frac{1}{4}$ of it forms part of the great and fertile plain of Lombardy, watered by the Panaro, which rises at the foot of Monte Cimone and falls into the Po in the territory of Ferrara. The principal river is the Secchia, which after a winding course of 100 m. joins the Po in Mantua. The principal productions are wheat, maize, hemp, flax, rice, pulse, olives, wine, and silk. Agriculture is in a backward condition. The farms are small, few exceeding 60 acres; dairy pasture prevails to some extent in the valley of Garfagnana; a few families own the large flocks of Apennine sheep; and the masses of the people, especially in the mountain districts S. of the Apennines, can seldom afford to eat meat. The vine is extensively cultivated in the neighborhood of Reggio and of the city of Modena. The mountains abound with oak, pine, and chestnut trees. Iron and other minerals are found, and the marble of Carrara is a lucrative article of export. The manufactures of silks, linen, canvas, leather, &c., are on a very small scale, and the commerce is equally trifling. The most active city of Modena is Reggio, the birthplace of Ariosto.—MODENA (anc. *Mutina*), the capital of the above state, is situated in a beautiful plain between the Panaro and the Secchia, about 25 m. W. N. W. from Bologna; pop. in 1855, 31,052. It has a citadel, is surrounded with ramparts, and is divided into the new and old city, a part of the *Æmilian* way intersecting the whole city. The cathedral, a Gothic edifice begun at the end of the 12th century, contains interesting tombs of the Rangoni family, one of which was designed by Giulio Romano, and is celebrated on account of its square marble tower, one of the highest in Italy, still containing the wooden bucket, *la secchia rapita*, once the cause of a feud between the Geminiani or Modenese and Petronii or Bolognese (so called from their respective patron saints), and immortalized in Tassoni's poem of that name. There are a great number of other churches in Modena; the most noticeable of them, on account of their colossal marbles, are those of St. Vincenzo, St. Agostino,

and San Francesco. The former ducal palace in the great square is a superb edifice, and contains a large collection of paintings by Guido, the Carracci, Andrea del Sarto, Carlo Dolce, Guercino, Pomarancio's "Crucifixion," and other remarkable works; but the best, including the celebrated *Notte* by Correggio (of which a copy is in the palace), were purchased by the elector of Saxony and are now in Dresden, while others were taken by the French. It still remains, however, one of the best collections in Italy. In one of the rooms is a recumbent Cleopatra by Canova, and the ceiling of the gallery is painted in fresco by Francesconi. The palace library, known as the *biblioteca Estense*, has about 60,000 volumes, and is particularly rich in MSS. A few Roman antiquities are pointed out at Modena, and the hymn sung by the Roman sentinels while they stood watch against the enemy on the summit of the city wall, is said to be still preserved.—The ancient Mutina is supposed to have been of Etruscan origin. According to Livy, the territory in which it was situated had been taken from the Boians, and after the final defeat of the latter it was colonized by the Romans (183 B. C.). According to Plutarch, Mutina, defended by Marcus Brutus, the father of Cæsar's murderer, was almost the only place able to offer any resistance to the arms of Pompey (78), and it became still more celebrated by the siege which it sustained and the battles fought between Decimus Brutus and Mark Antony, known as the Mutinian war (48). Cicero and other writers are unanimous in extolling the prosperity and strong military position of the city at that time; but afterward it suffered much from the calamities which befell the other parts of the empire, and toward the end of the 4th century it is described by St. Ambrose as in a deplorable condition. It survived, however, this crisis, and also the still more terrible ravages of Attila in the middle of the 5th century. Under the Lombard kings Mutina became the frontier city of their dominions toward the exarchate. At the close of the 6th century it was taken by the Greek emperor Maurice. Subsequently it was restored to the Lombard kingdom of Italy, but according to Muratori it was in a decaying condition for several centuries, chiefly owing to inundations, which reduced almost the whole of the city to the condition of a morass. Many of the remains of antiquity perished in the swamps, others were employed in the construction of new edifices, and some are now occasionally brought to light by excavations. After having been governed by Frankish counts for some time after the 9th century, it passed in the 11th under the government of its bishops. In the following century the city belonged to the countess Matilda of Tuscany. Subsequently it formed for some time part of the Lombard league; and after suffering from the family feuds which distracted for a long period the cities of N. Italy, it passed along with Ferrara into the possession of the Torelli, and submitted at the end of the 18th century

to the princes of the house of Este, who became the rulers of the city and its territory. The title of duke of Modena was formally conferred upon Borso of Este in 1452 by the emperor of Germany, and that of Reggio and Ferrara by Pope Paul II. Cesare of Este was compelled to evacuate Ferrara, Jan. 28, 1598, the city having been seized by Clement VIII. as a papal fief; but he retained the duchies of Modena and Reggio. In 1797 they were taken by Napoleon from the duke Ercole Rinaldo, and annexed to the Cisalpine republic. His only child and daughter Maria Beatrice (1752-1829), the last offspring of the Italian branch of the house of Este, married the archduke Ferdinand, 3d son of Francis I. of Austria, who became the founder of the Austrian house of Este. Her oldest son Francis IV. (1779-1846), who inherited the possessions of Massa Carrara, was reinstated as duke of Modena in 1814, and was succeeded in 1846 by his son Francis V. (born June 1, 1819), who married in 1842 a sister of the present king and a daughter of the ex-king Louis of Bavaria. His eldest sister is the wife of the count de Chambord, and his younger sister of a son of Don Carlos, another pretender. The death of Maria Louisa, the widow of Napoleon I. and duchess of Parma (Dec. 16, 1847), added the duchy of Guastalla to the Modenese possessions. Francis V., as well as his predecessors, was so much opposed to liberal systems of government, that in 1847 and 1848 he was compelled to depend on Austrian troops for protection against his own subjects. The Jesuits were expelled from Modena in March; after the revolt of the Viennese the duke was ready to make concessions, but it was too late, and Bolognese volunteers assisted the people (March 24) in overturning his throne and establishing a provisional government. He was compelled to resort to flight, but the triumph of Austria over Sardinia emboldened him to return to Modena (Aug. 10), although he was unable to make his rule acceptable to the people. An attempt upon his life was made Nov. 18, 1848; and after the resumption of hostilities between Austria and Sardinia he again deserted the city (March 14, 1849), which he left under the charge of his ministers, a garrison of Austrian and Modenese soldiers occupying the citadel. He came back to Modena in May, and endeavored to popularize his government by various reforms; but in June, 1850, the Jesuits were reinstated in their property and privileges. After the liberation of Lombardy by the Sardinian and French armies, and the invasion of parts of his territory, he fled from Modena (June 11, 1859), instituting a regency, which was overthrown two days afterward by the people, who declared themselves in favor of annexation to Sardinia, and Modena now forms part of that kingdom.

MOELLER, JENS, a Danish theologian and author, born in Copenhagen in 1779, died there in 1838. He was a graduate of the university of his native city, and officiated there for many

years as professor of theology. The *Theologisk Bibliothek*, and the *Tidsskrift for Kirke og Theologie*, are chiefly composed of his contributions, and comprise 44 vols. (Copenhagen, 1811-'84). His essays on the history of Denmark are principally contained in the *Historisk Kalender* (3 vols., 1814-'17), which he prepared in concert with Engelstoft, and in the *Mnemosyne* (4 vols., 1830-'34).

MCERIS, a lake of Egypt very celebrated in antiquity, situated near Crocodilopolis, now Medinet-el-Fayoom. The earliest and fullest account of it is given by Herodotus, who says: "Wonderful as is the labyrinth, the work called the lake of Moeris, which is close by the labyrinth, is yet more astonishing. The measure of its circumference is 8,600 furlongs, which is equal to the entire length of Egypt along the sea coast. The lake stretches in its longest direction from north to south, and in its deepest parts is of the depth of 50 fathoms. It is manifestly an artificial excavation, for nearly in the centre there stand two pyramids, rising to the height of 800 feet above the surface of the water, and extending as far beneath, crowned each of them with a colossal statue sitting upon a throne. The water of the lake does not come out of the ground, which is here excessively dry, but is introduced by a canal from the Nile. The current sets for 6 months into the lake from the river, and for the next 6 months into the river from the lake. While it runs outward it returns a talent of silver daily to the royal treasury from the fish that are taken; but when the current is the other way, the return sinks to one third of that sum. The natives told me that there was a subterranean passage from this lake to the Libyan Syrtis, running westward into the interior by the hills above Memphis." Herodotus ascribes the formation of this lake to a king Moeris who lived about 1850 B. C., and who is supposed by some modern Egyptologists to be identical with Amenoph III., the Memnon of the later Greeks and Romans. The Greek historian confounds together the natural lake Birket-el-Keroun, which is still existing in the province of Fayoom, and the artificial lake Moeris, which was connected with the former by canals. During the annual inundation of the Nile, at which time they were probably seen by Herodotus, the two lakes would appear as one. Moeris in reality was an extensive reservoir secured by dams and communicating by canals with all parts of Fayoom, to supply which with water was the object of its construction. M. Linant thinks he has found traces of the pyramids in the lake mentioned by Herodotus.

MCESIA (in Greek, Mysia, or Mysis in Europe), an ancient country of eastern Europe, bounded N. by the Savus (Save) and Ister (Danube), which separated it from Pannonia and Dacia; E. by the Euxine; S. by the Hæmus (Balkan) and Scardus ranges, separating it from Thrace and Macedon; and W. by the Drinus (Drin), which partly separated it from Illyricum. It thus corresponded to the modern

Turkish provinces of Bulgaria and Servia. It was divided by the Romans, who conquered it in the early period of the empire, into Upper and Lower (or western and eastern) *Moesia*, separated by the small river *Cebrus*. The western division was traversed by the *Margus* (*Morava*), and contained the important towns of *Singidunum* (now *Belgrade*) and *Naissa* (*Nissa*); in the eastern division was *Sardica*. The original inhabitants of *Moesia* were various Thracian tribes, the *Triballi*, *Peucini*, and others. Under *Aurelian* the *Dacian* colonies were removed there, when the middle part of the province also received the name of *Dacia Aureliani*. It was occupied by the *Goths* in the 4th century, who were called from their new abode *Mæso-Goths*, and became formidable to the eastern empire. Other hordes of barbarians frequently traversed it afterward.

MOGADORE, **MOGADOR**, **MOGODOR**, or **SURRAH**, a fortified seaport town of Morocco, on the Atlantic, 125 m. S. W. from the city of Morocco; lat. $31^{\circ} 50' N.$, long. $9^{\circ} 20' W.$; pop. about 16,000, $\frac{1}{4}$ of whom are Jews. It stands on an eminence, and is surrounded by a low sandy flat, which at high water is overflowed by the sea. It consists of two parts, one called the citadel, inhabited by *Moors*, and the other by Jews. The town is well supplied with water by an aqueduct. The houses are generally large and flat-roofed. Some of the mosques are splendid specimens of architecture. The trade, which is considerable, is chiefly in the hands of Jews. The chief exports are wool, gum, wax, hides, almonds, honey, ostrich feathers, ivory, and gold dust, and were valued in 1855 at \$1,500,000. The imports amounted in 1855 to \$800,000. The harbor is formed by an island S. of the town, and is considered the best on the W. coast of the empire. Mogadore was founded in 1760 by the emperor *Sidi Mohammed*, who intended it for his commercial capital. It was bombarded by the French under the prince de Joinville, Aug. 15, 1844. It suffered also in its trade during the recent war with Spain (1859-'60), and considerable amounts of money were collected by the Jews in the United States for the relief of those in Mogadore and other parts of Morocco.

MOGULS, a corruption of the term *Mongols*, used in Hindostan to designate the *Tartars* who repeatedly invaded that country in the middle ages, and who finally made themselves masters of Delhi in 1526, and placed their leader *Baber*, a descendant of *Tamerlane*, on the imperial throne of that city. The successors of *Baber* are known in history as the *Mogul* emperors, of whom the most eminent were *Akbar* (1556-1605), *Jehangheer* (1605-'27), and *Aurangzebe* (1658-1707). During these reigns the *Mogul* empire comprised nearly the whole of Hindostan, and in Europe the emperor was commonly called the *Great Mogul*. From the time of *Aurangzebe* the dynasty rapidly declined in power, until in the latter half of the 18th century it possessed only the semblance of sover-

eignty. In 1808 a British resident was stationed at Delhi, and ruled what remained of the empire in the name of the emperor till 1827, when even the appearance of authority was taken away, and the *Great Mogul* became merely a titled pensioner of England. The last of the dynasty, *Mohammed Bahadoor*, was deposed and transported in Dec. 1858, for complicity in the *sepooy* mutiny, and his family stripped of all titles and privileges.

MOHÁCS, a town of S. Hungary, in the county of *Baranya*, on the W. arm of the *Danube*, 25 m. E. S. E. from *Fünfkirchen*; pop. about 11,000. It is a station of the *Danube* steamers, and a centre of considerable trade. Two great battles were fought in its vicinity, marking the beginning and the end of Turkish sway in Hungary. The first took place Aug. 29, 1526, between *Solyman the Magnificent* and the Hungarian king *Louis II.* of the house of *Jagiello*. The Turks, who were flushed by recent conquests, many times outnumbered the hastily collected Hungarian army of about 25,000 men; but the warlike nobility were so eager to attack the enemy, that it was resolved not to wait the arrival of some reinforcements approaching under *John Zápolya*. The issue was bloody and disastrous. No fewer than 22,000 Hungarians fell, and among them were 500 magnates. The king perished in the flight, and his body was found in the marshy brook *Oselye*. His wife, *Mary*, a sister of *Ferdinand* of Austria, who in his turn had married *Anne*, the sister of *Louis*, hastened to carry the crown of Hungary to her brother, who was soon after enthroned at *Presburg* by a part of the nobles, while others elected *Zápolya* at *Stuhl-Weissenburg*. The contest between the two rival houses was afterward terminated by treaties; that between the *Hapsburgs* and the Turks was decided by arms, the second battle of *Mohács* (Aug. 13, 1687) closely following the reconquest of *Buda* from the Moslems. The Turks were commanded by the grand vizier, the *Austro-Hungarian* army by *Charles of Lorraine*; the former suffered a defeat and loss almost equalling that of the Hungarians 161 years before.

MOHAMMED (*Arabic*, the Praised), or **MAHOMET**, the founder of one of the most widely spread religions of the world, born in Mecca, according to *Muir*, in 570, but according to others in 567, 569, or 571, died, according to *Reinaud*, at Medina, June 8, 632. According to his Mohammedan biographers, his birth was accompanied by strange miracles; the sacred fires of the *Parsees* were extinguished, the palace of the Persian king was shaken by an earthquake, the lake *Sawa* dried up, and innumerable other prodigies took place. His family (*Hashem*) belonged to the distinguished tribe of *Koreish*, and were hereditary guardians of the *Caaba*; nevertheless his parents were poor. His father *Abdallah* died two months after his birth, and the whole property which he left to his widow *Amena* consisted of a house, 5 camels, an Abyssinian female slave, a few sheep,

and a slave called Sakran. The orphan was confined for a little more than two years to the care of a Bedouin nurse, Halima, who returned him to his mother in consequence of spasmodic fits which she attributed to evil spirits. At the age of 6 years he lost his mother, and was brought by a female slave to his grandfather Abd el Mottallib. Two years later he lost also his grandfather, and was then adopted by his uncle Abu Taleb, who held at that time the key of the Caaba. With him young Mohammed (in his 9th or 12th year) made journeys through Syria and other countries, and became acquainted with a Christian (probably Nestorian) monk, called by some Bahira, by others Serdjis, who predicted his future greatness. Another uncle, Zubeir, he accompanied in his 16th year on a mercantile trip to southern Arabia, and, in his 20th year, in a war against the Beni Kinanah. In his 25th year he earned his livelihood as a shepherd near Mecca, and then joined for a short time the business of a linen trader named Saib. At Hajar, a market 6 days' journey S. of Mecca, Mohammed became acquainted with a nephew of the rich widow Kadijah, who recommended him to his aunt as a trustworthy young man. Mohammed, compelled by poverty, offered to her his services, which were accepted. Several business journeys which he made for Kadijah through Syria and Arabia, not only enlarged his knowledge of the world, but also gained for him the esteem of Kadijah to so high a degree, that she determined to marry him. According to the common tradition Kadijah was then 40, and Mohammed a little over 25 years old. After his marriage Mohammed gave up business, thinking himself rich enough, and for 10 years was chiefly occupied with his family, having by Kadijah, notwithstanding her advanced age, 8 children, 4 girls and 4 boys, who died young. When 35 years old, he settled the dispute of the chiefs of Mecca, who quarrelled as to who should restore the black stone on the rebuilding of the Caaba. From the 35th to the 40th year of his life Mohammed frequently resorted to a solitary cave of the neighboring Mt. Hara, to give himself entirely up to religious contemplations. There, amid spasmodic convulsions, he had the first vision, in which the angel Gabriel appeared to him and commanded him to recite what he (the angel) said. The day and the month when this beginning of his mission occurred are not known; common tradition refers them to the 27th day of Ramadan. Mohammed and his wife were troubled as to the nature of his mission, whether it came from an angel or from an evil spirit; but Waraka, a Christian priest, who was a relative of Kadijah, acquainted them with the means of testing this, and the application of the test convinced them that it was a holy angel. The revelations continued henceforth without interruption to the end of his life. They were dictated by Mohammed to several secretaries, committed by his adherents to memory, and after his death collected and written down. (See KORAN.) During the first 8 years

of his mission only the relations and friends of Mohammed were called on to acknowledge him as a prophet, and the whole number of believers (*Moslem* or Moslems) amounted scarcely to 40, among whom were Abubekr and Ali. In the 4th (according to others the 5th) year of his mission he came forward publicly in compliance with a special commission, and proclaimed himself a prophet, but met only with imprecations and maltreatment. The Koreishites became greatly exasperated at him, and even the position of his followers became so dangerous that Mohammed advised them to emigrate to the country of a Christian prince of Abyssinia. A plot of his enemies against his life ended in the sudden conversion of Omar, who had undertaken to assassinate him, and who now became the staunchest of his adherents. To protect him from further attempts on his life, he was removed by his uncle Abu Taleb to a fortified castle outside of Mecca, where he remained 3 years. During this year an entire Christian caravan from Nadjran, and an exorcist who offered to relieve Mohammed from the devil, were converted. The Koreishites outlawed him with his friends, and affixed a document to that effect on the walls of the Caaba. When the interdict, after the expiration of 8 years, was removed, Mohammed returned to Mecca; and soon after, in the 10th year of his mission, he lost his uncle and protector Abu Taleb, who died as an unbeliever, having never acknowledged the mission of his nephew. Three days later he also lost his wife Kadijah, during whose lifetime he had not taken other wives; after her death he soon married several, 9 of whom survived him. After the death of his uncle, Mohammed was again expelled from Mecca, and also from Tayef, whither he fled for safety; but soon he reentered Mecca, greatly strengthened by the celebrated journey to heaven, where he had been saluted by God as the most beloved of his messengers. His relation of the journey increased, however, the exasperation of his enemies, and even caused the apostasy of some of his adherents. Soon after an event of the highest importance occurred. Some pilgrims from Yathreb, belonging to the tribe of Khazradj, were converted in 621 to a belief in Mohammed, and on their return propagated his doctrines successfully at home. In 622, no fewer than 78 Moslems from Yathreb appeared at Mecca, and concluded with Mohammed a treaty offensive and defensive. In September of the same year, in consequence of a new plot against his life, Mohammed fled to Yathreb, whither the Meccan believers, 45 in number, had partly preceded him, and partly soon followed him. On his way he also converted the tribe Beni Sahm. The arrival at Yathreb established the new faith on a firm basis, and not without reason therefore the era of the Moslems begins with the flight of the prophet, the Hegira. Moreover, the name of Yathreb was changed into Medinet el Nabi, "the city of the prophet" (Medina). Mohammed at first endeavored to gain

over to his religion the numerous Jews who lived in Arabia, and therefore made to them important concessions; but when he failed in this scheme, he not only rescinded the concessions, but became an irreconcilable enemy of all the Jewish tribes. During the first year of the Hegira he built a mosque at Medina, instituted a number of religious rites, and proclaimed war against the unbelievers as the heaven-ordained means to spread the true religion. He commenced this sacred war at once with attacks on the caravans of pilgrims, which led in the following year (623) to an engagement between 314 Moslems and 600 Meccans, who had been called by Abu Sofian, the chief of Mecca, to his aid. The Moslems remained victors, made many prisoners, and received for them a heavy ransom. In the following years Mohammed suffered many reverses; he was defeated by the Koreishites in the battle of Ohod (624), and besieged in Medina (627), and even among his followers a party was stirred up against him. To restore his reputation and influence, he determined to organize a large pilgrimage to Mecca, but was compelled by a dream to start when he had collected only 700 men. The Meccans prevented him from entering the city, but at last concluded a truce for 10 years, with the promise that the following year he would be admitted to the city as a pilgrim. To divert the discontent of his fellow pilgrims, he undertook with them another war against several Jewish tribes, in which he was on the whole successful; yet a Jewess, Zainab, to revenge the death of her relatives, prepared for him a poisoned lamb, which, as he firmly believed, destroyed his health. At this time the plans of Mohammed for the spreading of his religion assumed wider dimensions. He sent written demands to the Persian king Chosroes II., the Abyssinian king, the emperor Heraclius, the governor of Egypt, and the chiefs of several Arab tribes. Some received the ambassadors courteously, but Chosroes tore up the letter, while the people of Muta even killed the ambassador. In a war undertaken to revenge this murder the troops of Mohammed fought a desperate battle at Muta, in which Khaled, a new convert, highly distinguished himself, and was consequently termed by Mohammed "the Sword of God." He was successful in punishing the Meccans, who had broken faith with him; they were compelled, in order to save themselves, to acknowledge him as a sovereign and a prophet. The possession of Mecca decided the victory of the new religion in Arabia, and Mohammed was happy enough to see, notwithstanding some more temporary reverses, the subjection of a majority of the inhabitants of Arabia to his rule and to his religion. He himself returned to Medina, where he received in the 9th year of the Hegira deputations from various tribes who announced their submission. Feeling now sufficiently strong, he proclaimed a holy war against the Byzantine empire; but this proved a complete failure, he being obliged to

return to Medina amid the reproaches of the soldiers. In the following year Mohammed made the last pilgrimage to Mecca at the head of at least 40,000 pilgrims, in order to proclaim there orally the most important laws and doctrines of his religion. The rites of this pilgrimage have ever since been regarded as the standard rule for the pilgrimages of the faithful. Three months after his return to Medina, he was taken seriously ill. When his condition grew worse, he called all his wives together, and requested that he might be allowed to remain in the house of Ayesha, his favorite, which adjoined the mosque. He himself announced in the mosque the approach of his death, and promised to ask God's grace on behalf of all who would confess their transgressions. During the last days of his life he gave liberty to his slaves, caused 7 denars to be distributed among the poor, and prayed: "God support me in the agony of death." He expired in the arms of Ayesha, his last words being: "Yes—I come—among my companions on high." After a long dispute respecting the place of his interment, he was buried in the house in which he died. This spot lies now within the enlarged mosque, where it is annually visited by numbers of pilgrims. His only surviving child was Fatima, the wife of Ali, and the ancestress of all the sherifs or nobles of the Mohammedan world.—Mohammed is said to have been of middle stature, and to have had a strong beard and thick hair, a noble mien, a brown and lively complexion, a brilliant eye, a modest look, and white teeth. He had great natural eloquence, a keen intellect, and an overwhelming fluency, and was courageous and intrepid in dangers from which other men are used to shrink. Marital love he regarded as one of the greatest incentives to devotion, though the wish to have a son to succeed him has been alleged by some writers as the reason why he took so many wives. His only male issue, Ibrahim, died at the age of 15 months, and his loss drew from the prophet an extraordinary outburst of grief. In his infancy as well as in after life he was afflicted with epileptic attacks, which at first were considered by himself and by his enemies to be the effect of demoniacal possession. The same spasmodic convulsions accompanied him while he received his revelations. "Then," as a Mohammedan historian says, "the sweat fell from his forehead during the coldest weather, his eyes became red, and at times he roared like a young camel." Christian biographers have often inferred from this that Mohammed was really possessed of a devil, and that the mystery which envelopes the revelations of Mohammed can be solved only by the assumption of satanic influence. Mohammed was acquainted with the doctrines of both the Jews and Christians, but charged them with having corrupted their Scriptures. How he obtained this knowledge, and to what extent he possessed it, has not yet been entirely cleared up. He attributed to both of them doctrines which they do not hold, but most of these statements may rest on the au-

thority of the apocryphal books of the ancient Christian church.—Before the 12th century it was hardly understood in the West that Mahomet was a man, and not a pretended divinity, and still earlier he was known as Maphomet, Baphomet, or Bafum, and believed to be a false god to whom human sacrifices were offered. Later it was common among Christian writers to represent him as a conscious impostor. This opinion has now but few representatives, especially since Möhler and Carlyle in his "Hero Worship" have shown that it is hardly reconcilable with the devotion which appears in his life, and with the revolution effected by him.—Among the Mohammedan biographies of the prophet, those of Wackidi, Hishani, and Tabari are the most important; while later historians, as Abulfeda (formerly considered the chief authority), are now regarded as having no historical weight. Among the best European and American biographies of Mohammed are those of Maracci (Padua, 1698), Gagnier (Amsterdam, 1732), Hammer-Purgstall (Leipsic, 1837), Weil (Stuttgart, 1848), George Bush (New York, 1882), Washington Irving (New York, 1852), A. Sprenger (Allahabad, 1852), Muir (London, 1858), and Arnold ("Ishmael, or a Natural History of Islamism," London, 1859).

MOHAMMED II., a Turkish sultan, surnamed **THE GREAT** and **THE VICTORIOUS**, born in Adrianople in 1430, died at Teggair Zair, a small town in Asia Minor, in May, 1481. He was the eldest son of Amurath II. by a Christian princess of Serbia, and succeeded him in 1451. He began his reign by a general reformation of the laws of the empire, and by calling to a severe account the treasurers and other officers of his father. He then led an expedition into Asia against the sovereign of Caramania, who had invaded the Turkish dominions, and who was speedily reduced to submission. He next turned his arms against Constantinople, which he invested in April, 1453, with a large fleet and an army of 800,000 men. After a siege of 53 days the city was taken by storm, May 29, and for 8 days given up to pillage and massacre. Having determined, however, to make Constantinople his capital, to attract population thither, the sultan proclaimed religious toleration and various privileges and immunities to the inhabitants. These measures soon rendered the city populous and flourishing. Mohammed next, in 1454, completed the conquest of Serbia, which had been left unfinished by his father. But in 1456 he was baffled by the great Hunyady in the siege of Belgrade, from which the Turks were repulsed with the loss of 25,000 men, while the sultan himself was severely wounded. He next turned his arms against the Morea, which was still held by two Greek princes, Demetrius and Thomas, the latter of whom made a gallant though finally unsuccessful resistance, which led Mohammed to remark that he had found among the Greeks many slaves, but no man except Prince Thomas. The conquest of the Morea was completed in 1460, with the exception of some fortified seaports

held by the Venetians. In the following year the little kingdom on the S. shore of the Black sea, called the empire of Trebizond, was subjugated in a short campaign, and its ruler the emperor David Comnenus put to death with all his family, except the youngest son, who became a Mohammedan, and a daughter who was placed in the sultan's harem. Wallachia was next invaded and made tributary, and most of the islands of the archipelago were subjugated. The prince of Mitylene defended the capital of that island for a month, and finally was induced to surrender on condition of receiving an equivalent province; but Mohammed, faithless to his promise, kept him a while in prison, and then put him to death. The Christian powers, alarmed at his progress, agreed in a conference held at Mantua to enter on a new crusade against the Turks; but the internal difficulties of the European kingdoms prevented the execution of this scheme. The famous Scanderbeg, prince of Epirus or Albania, gave the first serious check to the triumphs of Mohammed by defeating several armies sent against him under Turkish generals of reputation. The sultan at length invaded Albania in person with an army computed at 200,000 men, and laid siege to Scanderbeg's capital, the city of Croia; but his camp was so harassed by Scanderbeg's assaults, that at length after great losses he was forced to retreat. In the following spring he renewed the attempt to take Croia, but was again forced to withdraw to his own dominions. Scanderbeg, however, died in 1466, and Albania, which had been preserved only by his valor and military genius, soon became a Turkish province. During the war with Scanderbeg the sultan was also engaged in hostilities with the Hungarians and the Venetians. From the latter he conquered Negropont in 1470, after a long siege in which he lost 40,000 men; and though the governor of Chalcis, the capital, surrendered upon condition of personal safety, he was put to death, as were all the rest of the captives. The Venetians now entered into an alliance against the Turks with Pope Sixtus IV., the kings of Naples and Cyprus, the grand master of Rhodes, and the shah of Persia. The fleets of the Christian allies attacked the coasts of the Turkish dominions and burned Smyrna and other places, while the Persians on their part invaded the eastern part of the empire in great force, and defeated Mohammed's eldest son Mustapha in a pitched battle near the Euphrates. Mohammed himself, with an army of 320,000 men, encountered the Persians in Armenia, and was defeated with the loss of 40,000 men. In a second battle, however, he was victorious, and the Persians suffered such severe loss that they withdrew from their alliance with the Christian princes and concluded a peace with the sultan in 1474. In the following year Mohammed wrested Kaffa and several other ports in the Crimea from the Genoese, and made the khan of the Crim Tartars tributary. In 1479 the Venetians treated for peace, and agreed to

give up Lemnos, Scutari, and other strong places, retaining several fortresses in the Morea, and paying a tribute for the liberty of trading in the Black sea. In the following year Mohammed sent an army of 80,000 men to besiege Rhodes, which was defended by the knights of St. John with brilliant valor for upward of 8 months, when the Turks after sustaining immense losses raised the siege. At the same time another of the sultan's armies invaded Italy and took the city of Otranto, which was recovered in 1481 by a general effort of the Italian states, aided by Spain, Portugal, and Hungary. The sultan was preparing to renew the attack on Rhodes when he died, not without suspicion of poison, after an illness of 8 days. Mohammed II. was one of the ablest of the Turkish sultans, and is said to have conquered 2 empires, 12 kingdoms, and 200 cities. He is thus described by Richard Knolles in his "History of the Turks" (1610): "He was of stature low, square set and strong limbed. His complexion was sallow, his countenance stern, and eyes piercing, though a little sunk. His nose was so high and crooked that it almost touched his upper lip." Collections of his letters translated into Latin have been published at Lyons (1520), Basel (1554), Marburg (1604), and Leipsic (1690).

MOHAMMED IV., a Turkish sultan, born in 1642, died June 22, 1691. In 1648 he succeeded his father Ibrahim I., who was deposed and strangled by the janizaries. Mohammed Kuperli or Kuprili, an Albanian of eminent ability, was made grand vizier. To him, and to his equally distinguished son who succeeded him, the reign of Mohammed IV. owes all its celebrity. The sultan himself had neither talent nor energy, and cared little for any thing but hunting, in which he spent most of his time, and lavished vast sums. The empire at his accession was in the utmost confusion, but Kuprili restored order by promptly putting to death the leaders of sedition. In 1644, a Maltese vessel having been allowed by the Venetians to carry a Turkish vessel as a prize into a port in the island of Candia, which was then in their possession, Sultan Ibrahim had declared war against the republic, and in the following year the Turkish forces had conquered the greater part of Candia. This war continued after Mohammed's accession, and was not for some time prosecuted with much spirit by the Turks, Kuprili being wholly occupied in reestablishing domestic tranquillity. The Venetians defeated the Turkish fleet near Scio, June 24, 1651, and destroyed a second fleet, June 26, 1656, and shortly afterward captured the islands of Lemnos and Tenedos, which however the Turks regained in the following year. The contest with the Venetians continued with various fortune till 1667, when Achmet Kuprili, one of the greatest of Turkish generals, who had succeeded his father as grand vizier in 1664, undertook the siege of the city of Candia, which he prosecuted with vigor for 2 years and 4 months, when, after a defence which enlisted the sympathy of all

Christendom, the Venetian commander Morosini was compelled to capitulate, Sept. 6, 1669, while at the same time peace was concluded between Venice and Turkey. In 1680 war had broken out with the emperor Leopold I. of Austria, and for some time the Turks had been highly successful in Hungary. Germany, France, and Italy combined to check their progress, and Montecuculi, the general of the allies, gained a brilliant and decisive victory over them, Aug. 10, 1684, at St. Gothard on the Raab, which was immediately followed by the treaty of Temesvár, which put an end to the war. In 1672 the sultan declared war against Poland, invaded that country in person, and took Kamieniec. A treaty unfavorable and ignominious to Poland was agreed to by King Michael; but the diet refused to ratify it, and the grand marshal of the kingdom, the heroic John Sobieski, continued the war, and in 1673 gave the Turks a total defeat at Chocim, and in 1676 obtained from them an honorable peace. An insurrection of the Hungarians under Tökölyi tempted the sultan in 1682 to again make war upon the emperor; and in July, 1683, an army of 300,000 Turks, commanded by Kara Mustapha, invested Vienna. The emperor fled with his family to Lintz, and all Europe awaited with anxiety and dread the result of the siege. The city was in the last extremity when Sobieski and Charles of Lorraine came to its relief, and on Sept. 11 attacked and totally routed the Turks, who suffered immense losses. After this great defeat the Turks met with nothing but disasters. Germany, Poland, Russia, and Venice combined against them; and on Aug. 12, 1687, Charles of Lorraine gave them a terrible defeat at Mohács, which was followed by the loss of Transylvania and other provinces. These misfortunes excited great discontent in the Turkish army, which at length broke into mutiny at Belgrade, and, marching to Constantinople in the latter part of 1687, dethroned the sultan and raised his brother Solyman III. to the throne. Mohammed was kept imprisoned till his death.

MOHAMMED ALI. See **MEHMET ALI.**

MOHAMMED BEN YUSSUF. See **AR-
GHALIB-BILLAH.**

MOHAMMEDANISM, the name commonly given in Christian countries to the creed established by Mohammed. The followers of the creed themselves neither use nor acknowledge the name. They call their creed Islam, which means "full submission to God," and choose for themselves the name Moslem, or "the people of the Islam." Mohammed designated himself as the restorer of the pure religion revealed by God to Abraham. As the messenger of God he required his pagan countrymen to leave their idols and adopt the worship of the one true God; of the Jews, to exchange the law of Moses intended for only a limited period for the new and final revelations given to him; of the Christians, to cease worshipping Christ as God, as inconsistent with the idea of monotheism and with the true doctrine of Christ himself.

The doctrines of Mohammedanism may in large measure be traced to the national religion of the Arabs before Mohammed, and to those forms of Judaism and Christianity which existed in Arabia at the time of Mohammed. To what extent Mohammed borrowed from these three sources severally, is a question which was until recently involved in the greatest obscurity, but which the profound researches instituted during the last 20 years have begun to clear up. (See Geiger, *Was hat Mohammed aus dem Judenthum aufgenommen?* Bonn, 1833; Gerok, *Versuch einer Darstellung der Christologie des Koran*, Hamburg, 1839; Möhler, *Ueber das Verhältniss des Islamismus Christenthum*, Ratisbon, 1839.)—The sayings of Mohammed relative to his religion were collected in the Koran, which is recognized by all Mohammedan sects as their rule of faith and morals. But the great majority of the Moslems recognize, in addition to the Koran, the Soonna, or traditions, embodying the expressions, occasional remarks, and acts of Mohammed, which are traced back to his companions, his wives, and the first caliphs. Not only do they regulate, conjointly with the Koran, the doctrines, rites, and ceremonies of the Mohammedans, but the interpretation of the Koran is determined by them. There is much uncertainty among the Moslems regarding them; some sects, as the rationalistic Montasales, and the extremists among the Sheeahs, reject the Soonna altogether; the moderate Sheeahs acknowledge a tradition, but differ from the Soonnees respecting its extent. (See SOONNA, and SHEEAAHS.) Among the Soonnees 4 orthodox schools were distinguished, all established between 740 and 840. They were called, after their founders Hanifa, Malek, Shafei, and Hanbal, the Hanifites, Malekites, Shafeites, and Hanbalites. The 1st and 4th were of little influence; the 2d prevailed in northern Africa and Spain, and the 3d in the eastern countries. Their differences were not in doctrines, but in discipline only. The two largest and most influential collections were made by Bukhari (died 869) and Abu Moslim. An extract from these two and some later collections was made by Hosein ibn Masud (died 1122), under the title *Masabih* (lights). It was translated into English, together with a commentary (*Misheat*) by Wadi-eddin Abu Abdallah Mahmoud, who lived about 1169, by A. N. Mathews (*Misheat ul Masabih*, or a Collection of the most Authentic Traditions," 2 vols., Calcutta, 1809). Most of the traditions received by the Sheeahs are contained in the books of *Hayat ul Kulub*, *Hag ul Yaqin*, and *Ain ul Hayat*, written by Mullah Mohammed Bakir Majlisi, a famous Persian divine, who lived about 1650, and which were printed in Teheran in 4 vols. fol. In the 8th and 9th centuries the rationalistic school, called by their opponents Montasales or Separatists, gained great strength and influence. Their chief seat was at Bassorah, where they formed an association of rationalistic scholars. They maintained the absolute self-determination of man, denied the eternity

of the Koran, and also rejected the reality of the divine attributes so far as to divest God of all those characteristics which are the expression of a personal existence. In the 10th century an orthodox school of scholasticism regained the ascendancy, especially through the efforts of El Ashari, the father of the later orthodox theology; and from this time the doctrines and the ethics of the prevailing denomination underwent no other considerable change. The gradual development of Mohammedan doctrines, and their relation to the Koran, are still subjects of controversy. We give an outline of the system of doctrines and ethics which generally prevails.—The Mohammedans have no general confession of faith, except the one: "There is no God but God, and Mohammed is his prophet;" to which the Sheeahs add: "and Ali is the vicar of God." The arrangement of the system of doctrines and the division into chapters varies greatly with different writers; but a work entitled "The Fundamental Doctrines of Nesefi" (died 1142) is particularly esteemed. Every doctrinal work begins with the doctrine of God. He is one, spiritual, eternal, existing of himself. The attributes of wisdom, omnipotence, and mercy really belong to him. The word (which is read in the Koran) is eternally in him, but without sound. The Koran is the uncreated word of God. The world is not eternal, but has been created in the course of time by God. The accounts of the creation and of the prophets greatly resemble those of the Old Testament. Adam is the first, Mohammed the last prophet. The prophets were saints, and have proved their mission by miracles. The heavenly books—the Pentateuch, the Psalms, the Gospels, and the Koran—have been communicated to men by the hands of the prophets. Mohammed before his death really ascended to heaven. For the observers of the laws proclaimed by the prophets there is a heaven, and for the transgressors a hell, both of which are fully described in the Koran, about one sixth of that book being filled with details on this subject. According to the common view of the Moslems, the passage of man into the other world takes place in the following manner: The dead are subjected by the angels Munkir and Nakir to an examination, which is followed by an examination before God himself; the former is greatly feared. The dead will rise again; the balance in which they are weighed, the book in which their deeds are noted down by the angels, and the bridge Sirat, as thin as a hair, which is stretched over hell, are, according to common opinion, more than mere images. Paradise and hell are created, but will never end. Many prominent theologians assume the existence of an intermediate state for noble unbelievers (pagans). The faithful will not remain in hell for ever, and the prayer for the dead is as useful as that for the living, and the intercession of Mohammed is of special efficacy. Before the end of the world many important phenomena are to take place. The adversary of all true religion ("the liar") will come. Gog

and Magog will rise again, but Jesus the son of Mary will aid in the final triumph of the Islam. Over the fate of man rules the unchangeable will of God. The freedom of man in choosing between good and evil is asserted, but without mitigating the doctrine of predestination which borders upon fatalism. An essential branch of Mohammedan theology is its pneumatology, with regard to which it is difficult in many instances to say how much belongs to the Koran alone, how much has been added by the Soonna, and how much is merely popular belief. The first among the angels are the bearers of the divine throne; next comes the Spirit; next are the archangels Israfil, Gabriel, Michael, and Azrael; the cherubim; the angels who in military order celebrate the praises of God in the seven heavens; the recording angels, who write in a book the merits and sins of men; the guardian angels, who watch over individual men (every believer has 160) and things. Eblis, the devil, fell through pride and disobedience, and was expelled from paradise; but at his request God gave him a respite until the days of the resurrection. Where he abides until then is not stated in the Koran, but he is declared to be the author of all bodily evils and of all anti-Moslem impulses, sentiments, and movements, but of sin only so far as it is not consistent with Islamism. The djins or genii are a kind of link between the good and the fallen angels. Like the angels, they are created from fire; they rove over hill and dale, displaying their nature, especially at night; and so great is their swiftness, that one of them brought the throne of the queen of Sheba in the twinkling of an eye and placed it before Solomon. The work of Neseft declares that the human race rank above the angels; only such angels as perform the services of apostles or prophets, like Gabriel, precede men; but on the other hand, the prophets from the human race are higher than the prophets from among the angels. The Islam assumes a human authority which teaches, commands, and forbids in the name of God; the men invested with this authority are called imams. The Islam inculcates most of those moral laws which are found in all religions. It emphasizes 5 commandments for specific times and circumstances, purification, prayer, fasting, alms, and the pilgrimage to Mecca. The Moslems are noted for their zeal in prayer. Every Moslem is bound to offer up prayer 5 times a day, at daybreak, at noon, in the afternoon, at sunset, and one hour and a quarter after it. In every town the faithful are invited to these prayers by a public crier, or muezzin, whose call contains short praises of God, a short confession of faith, &c. At the morning prayer he adds: "Prayer is better than sleep;" instead of which the Sheeahs say: "Come to the best work;" a difference which has given rise to bloody wars. After the call of the muezzin the Moslem may perform his prayers at any decent place, except that on Friday he is bound to perform them in the mosque. Beside these daily and weekly

devotions, they have two annual services in the two Beirama, which are movable festivals according to the computation of the Mohammedan year, and have reference to the fasting in the month Ramadan, and the *hadj* or pilgrimage to Mecca. They have also a kind of rosary devotion, consisting in the recitation of the 99 attributes of God followed by the name of God itself, according to 100 balls strung on a coral string. Charity is not strongly inculcated in general, but every Moslem who is not poor is obliged to give the 40th part of his property to the poor. The eating of pork is forbidden, as among the Jews; the same is the case with the drinking of wine. Mysticism and asceticism were early cultivated by the Moslems, and called forth Soofeism, the monachism of the Islam, a phenomenon of the greatest importance for a right understanding of the true character and the bearing of their doctrinal system.—On their first promulgation the doctrines of Mohammed spread with amazing rapidity. In 12 years the whole of Arabia had embraced the Islam. Abubekr, the first caliph, declared war against all nations, especially against the emperor of Constantinople and "the great king of Persia," at that time the two most powerful monarchs of the world. The battle of Bostra opened Syria to the Arabs; and one of the first feats of Omar, the successor of Abubekr, was the conquest of Damascus. Soon afterward a battle near the lake of Gennesareth decided the fate of Syria. Jerusalem capitulated on easy terms, and with brief interruptions has remained subject to the Mohammedans, and is one of their three holy cities. One of the generals of Omar, Amru, completed the conquest of Egypt, and fairly commenced that of northern Africa. On the whole of the S. shore of the Mediterranean the Arabs met with little resistance; for, recognizing in the inhabitants people of the same stock, the introduction of their religion was greatly facilitated. Soon after the death of Omar, Persia was entered by Khaled, Irak or Assyria subdued and plundered, the Euphrates together with the gulf of Persia fell into the hands of the Arabs, and Ctesiphon and Faristan, whither the king of Persia had fled, were placed under Moslem domination. On the appointment of Ali to the caliphate those great internal struggles commenced, which have ever since rent the Mohammedan world, without however arresting its external extension. Moawyah, the rival of Ali, took possession of most of the Persian provinces, and established the Islam in Europe by getting a foothold in Sicily. He was still more fortunate in Africa, and from 697 the whole of N. Africa may be considered as the home of Islamism, Christianity, which once flourished in that country, being completely uprooted. At the beginning of the 8th century, the Mohammedans, under Tarik, crossed to Spain; one province after another was speedily subdued, and for 800 years the Saracens retained a dominion in that country. A few years later, Abderrahman with a force of 400,000

men entered Gaul, but they were defeated in the decisive battle between Tours and Poitiers by Charles Martel (A. D. 732), which put a final stop to their progress in western Europe. In Asia they advanced eastward in China and India; in the former country their progress was soon stayed, but in the latter they founded vast empires on the shores of the Indus and Ganges, which for a long time were strongholds of Islamism. Fresh energy was infused into the Moslem community by the accession of the Seljook Turks. Having been called to his aid by Mohammed ben Jubriel, they seized upon Persia, made themselves masters of a portion of the Byzantine empire, and established one of the seats of their government at Iconium or Konieh. Having withstood the repeated attacks of the Christian world during the period of the crusades, they were overrun by other Tartar tribes, also of Turanian origin, who passed over Persia, Armenia, and Asia Minor, and laid the foundation of the empire of the Ottomans, or Turks properly so called. Both the Seljooks and their successors, the Osmanlis, voluntarily received Islamism from the very people they conquered, the first instances of the peaceable conversion of an entire tribe to the Islam. The Ottoman rulers gradually undermined the Byzantine empire; Amurath I. entered Europe and made Adrianople his capital; Amurath II. left nothing to the Greek emperor but Constantinople; and Mohammed II. struck the fatal blow, taking Constantinople in 1453 after a siege of less than 2 months. The Ottoman empire, and with it the political power of the Islam, were now at their zenith; the Turks became for many centuries the terror of Italy, Hungary, and Germany, but Christendom ceased to suffer any considerable losses by their advance. On the other hand, the Christian nations began to conquer considerable portions of Moslem territory. Sicily had been lost before this period; in Spain the power of the Mohammedans had been on the decline for centuries, when in 1492 their last strongholds were taken; their powerful empires in India were entirely overthrown; Greece commenced its successful struggle for independence in 1821, Algiers was wrested from them in 1830; and the dependence of the Danubian principalities on the Ottoman Porte long since became merely nominal. Mohammedanism has continued, however, and still continues to make peaceable conversions in the interior of Africa. It is widely propagated in Soodan, and reigns in its strictest form in Bornoo; it prevails in the kingdoms of Ghana, Tokroor, Boocsa, Berissa, Wawa, and Kiama; and it is the established religion in Timbuctoo. A remarkable instance of the progress of the Islam is found in the history of the Mandingoes, N. E. of Sierra Leone. A century ago a few Mohammedans settled in that country; they established schools, in which Arabic and the Koran were taught; a community was formed, and after some time the whole country fell into their power. Great efforts are still made to proselyte

the pagans in the interior of Africa, and every year adds fresh tribes to the Moslem community. The Galla tribes are converted one by one; and in Malabar the Mohammedans purchase or procure children of the lower classes to bring them up in the "true faith." But while the Islam advances among races inferior to the original Mohammedans in point of civilization, its foremost representative among the great nations, the Ottoman empire, lives avowedly at the mercy of the great powers of Europe; Persia has felt the superiority of Russia, and Morocco has been defeated by Spain. The consciousness of this superiority of the Christian nations has been spreading for years throughout the extent of the Mohammedan world, and has gradually kindled those sentiments of fierce and uncompromising hostility to the Christian name, which have manifested themselves within the last few years in so bloody a manner in India, Arabia, northern Africa, and Syria. The approach of another holy war to revive the glory of the Islam is extensively preached; but those who stand highest among the Mohammedans, and have seen and tasted the fruits of Christian civilization, no longer exhibit any confidence in the power of the Islam.—The total number of Mohammedans at the present time is estimated at about 160,000,000. In Europe they are almost confined to Turkey, and even there they form in the European part of the empire a minority of the population—6,000,000 out of 16,000,000. In Russia, European and Asiatic, they count 2,557,835 souls. They prevail in Asiatic Turkey, Persia, Afghanistan, Beloochistan, Arabia, and Tartary, and are largely represented in India and the Malay archipelago, and to some extent in China. In all, their number in Asia is estimated by Dieterici at about 50,000,000. In Africa, the Islam is still the predominant religion in the entire north, and its rule extends far down eastward and into the centre of the continent; and it is believed that full one half, or about 100,000,000 souls, may be set down as Mohammedans. In America and Australia they are not represented at all.—More detailed accounts of the several national branches of Mohammedans will be found in the articles in this work devoted to the Mohammedan countries. On the cultivation of literature and art by the Mohammedans full information may be obtained in the articles on the Arabic, Persian, and Turkish literatures. One of the best treatises on Mohammedanism is that of Döllinger, *Muhammed's Religion nach ihrer innern Entwicklung und ihrem Einflusse auf das Leben der Völker* (Ratisbon, 1888). See also Taylor, "History of Mohammedanism;" Mill, "Mohammedanism" (London, 1817); Arnold, "Ishmael, or a Natural History of Islamism" (London, 1859).

MOHAMMERAH, a town of Persia, on the left bank of the Euphrates, about 40 m. from the sea; pop. about 4,000. Its position gives it great commercial advantages. A canal connects it with the Karun and with the fertile

regions of Khuzistan, while by means of the Euphrates it communicates with Bassorah, Bagdad, and the Persian gulf. During the war of 1857 it was bombarded and taken by the British under Sir James Outram; after the conclusion of peace it was restored to the shah.

MOHAWK, a river of New York, which rises in Oneida co., about 20 m. N. from Rome, from which place it flows S. E. and E. through Herkimer, Montgomery, Schenectady, and Saratoga counties, falling into the Hudson at Waterford, 10 m. above Albany; length, 185 m. At Little Falls, Herkimer co., and "The Noses," Montgomery co., the river has forced its way through the mountain barriers, and flows through deep, rocky ravines; and at Cohoes, 1 m. from its mouth, it falls over a precipice 70 feet in perpendicular height. During its course it supplies great and valuable water power. The Erie canal and the New York central railroad follow its banks as far as Rome. Rome, Utica, Little Falls, Schenectady, and Waterford are the principal towns on its banks.

MOHAWKS, a tribe of American Indians, one of the six nations named collectively by the French the Iroquois. According to their own tradition, confirmed by those of other tribes, they were the eldest people in the league. They believed that they were liberated from subterranean confinement by Tareya-wagon, who guided them into the valley of the Mohawk; thence they passed to the Hudson and to the sea; but the valley in which they at first established themselves was the seat of their power from the discovery of the country until the American revolution. Their dominion extended from Lake Champlain to the head waters of the Susquehanna and the Delaware. Renowned above all the other nations for their skill as warriors, they carried terror wherever they went. Their forays were pursued as far as the Connecticut river, and their influence prevailed among the small independent tribes about the region of the present city of New York. During the French and Indian war they supported Sir William Johnson, following him in his most perilous expeditions, and aiding him in the contests of Lake George and Niagara. After his death they transferred their attachment to his family, and were forced to flee from their ancestral home to Canada. A few of them now reside with their brethren, the Senecas, Tuscaroras, and Oneidas, but the greater portion occupy lands appropriated for their use by the British government, at Brantford, on the Grand river of Canada West. To this place they followed their leader Thayendanegea (Joseph Brant) at the close of the revolution.

MOHEGANS, or **MOHICANS**, a tribe of American Indians, of Algonquin lineage, which inhabited during the early period of the Iroquois confederacy the country now forming the S. W. parts of New England, and that portion of New York E. of the Hudson. They retired before Iroquois conquests over the highlands into the valley of the Housatonic, but were early dis-

possessed of that territory by the whites. The few of them that now remain are scattered among other tribes.

MOHILEV, or **MOGHILEV**, a S. W. government of European Russia, bounded N. by Vitetsk, E. by Smolensk and Tchernigov, S. by Tchernigov, and W. by Minsk; area, about 20,000 sq. m.; pop. in 1856, 873,888. The surface is generally level, and the soil fertile. The climate is mild and dry. There are several small lakes and marshes. The principal river is the Dnieper. Bog iron is found in abundance.—**MOHILEV**, the capital, is situated on the right bank of the Dnieper, 212 m. W. S. W. from Moscow; pop. about 21,000, including many Jews. It is the seat of a Greek archbishop, and of the Roman Catholic archbishop and primate of Russia and Poland (in 1860, Wenceslaus Zylinaki), and is also a favorite residence of the Russian nobility. It was taken by Charles XII. in 1708, and recovered by Peter the Great in 1709. A meeting of Joseph II. and the empress Catharine took place there in 1780. A portion of the Russian army was defeated there by the French, July 23, 1812.

MOHL, **JULIUS VON**, a German orientalist, naturalized in France, born in Stuttgart, Oct. 28, 1800. He studied at Tübingen and Paris, and in 1826 was appointed professor of oriental literature in the university of Tübingen, but was permitted to continue his studies for some time in Oxford and London. Subsequently, on being intrusted by the French government with the preparation of an edition of Firdusi's *Shah Nameh* for the *Collection orientale*, he relinquished his chair, and since 1832 has resided in Paris. In 1844 he succeeded the elder Burnouf as a member of the academy of inscriptions and belles-lettres, in 1845 Joubert as professor of the Persian language at the collège de France, and in 1852 Eugène Burnouf as inspector of the publication of oriental works in the *imprimerie impériale*, and as secretary of the Asiatic society, of which previous to that time he had been assistant secretary. His edition of Firdusi's celebrated poem is still in progress; the first 4 vols., in Persian and French, appeared between 1838 and 1854.

MÖHLER, **JOHANN ADAM**, a Roman Catholic theologian, born at Igersheim, Würtemberg, May 6, 1796, died in Munich, April 12, 1838. Having pursued his classical and theological studies at Mergentheim, Ellwangen, and Tübingen, he was ordained priest in 1819, and appointed in 1820 tutor in the seminary (*Wilhelmstift*) connected with the faculty of Catholic theology at Tübingen. His intention to devote himself to the study of classical philology was changed by an invitation of the theological faculty to lecture on theology. Before he entered on his new office, he was enabled by a stipend from the government to visit the principal Catholic and Protestant universities of Germany. On his return he commenced a course of lectures on church history, patrology, and canon law, which at once established his repu-

tation as an eminent theologian. At the same time he became a regular contributor to the "Theological Quarterly," published by the faculty of Tübingen, which was then and is still the leading journal for scientific theology in Catholic Germany. In his first articles he strongly sympathized with the reformatory movements which then agitated the Catholic church of S. W. Germany; he advocated the restoration of communion in both kinds, the abrogation of the use of Latin in the divine service, &c.; but in later years he abandoned these views, and the articles expressing them are not included in the collection of his minor works published by Dr. Döllinger (*Gesammelte Schriften und Aufsätze*, 2 vols., Ratisbon, 1839). In 1825 he published his first great work on "Unity in the Church, or the Principle of Catholicism according to the Church Fathers of the first three Centuries," which was regarded by Protestants and Catholics as one of the most important works of this century in defence of the Roman Catholic church, although not a few Catholic theologians were of opinion that Möhler had made too great concessions to Protestantism. Soon after the publication of this work (in 1826), he received a call as professor of theology to the university of Freiburg; and when he declined, the government of Württemberg appointed him extraordinary professor at Tübingen. In 1827 he published his second important work, "Athanasius the Great, and the Church of his Times, especially in its Contest with Arianism" (2 vols., Mentz), for which the faculty of Tübingen conferred on him the title of D.D. His last and greatest work, "Symbolism, or Exposition of the Doctrinal Differences between Protestants and Catholics" (Mentz, 1832; 5th ed. 1838; English translation by Robertson), caused an extraordinary sensation in the theological world. The Protestant theologians conceded to him that he had succeeded in representing the Roman Catholic church in a more advantageous light than any other theologian since Bossuet; but they also maintained that he had not represented actual, but ideal Catholicism, and that he had misrepresented, at least partly, the doctrinal systems of the reformers of the 16th century. Some of the most distinguished Protestant divines wrote against him; especially Baur (*Der Gegensatz des Katholicismus und Protestantismus*, Tübingen, 1833; 2d ed. 1836), Marheineke, and Nitzsch. Möhler answered them, especially Baur, in his "New Investigations on the Doctrinal Differences between Catholics and Protestants" (Mentz, 1834). Baur replied again in the new edition of his work, but the continuation of the controversy was forbidden by the government, and Möhler was censured for having revived an obsolete contest. This turn of the controversy disgusted him with Tübingen, and when the Prussian government again offered him a professorship either at Bonn, Breslau, or Münster, he chose Bonn, but subsequently declined, when the archbishop of Cologne demanded that he should expressly retract his work on

"Unity in the Church," a condition to which he was unwilling to consent. In 1834 he accepted a call to the university of Munich, but his lectures were interrupted by sickness in 1836, and he never fully recovered. Two months before his death he wrote, on the imprisonment of the archbishops of Cologne and Posen by the Prussian government, his last article in the interest of his church, yet with such moderation and in language so dignified, that the Prussian government made a last and again unsuccessful effort to secure his services for one of the national universities. At the time of his death he was occupied in collecting materials for a history of monachism, fragments of which are published in the collection of his miscellaneous writings. This contains some other articles, which are counted among the most thorough works on their various subjects; especially on the relation of Islamism to Christianity, on the Pseudo-Isidore, on Gnosticism, on the history of the abolition of slavery, &c. A larger posthumous work on the Christian literature of the first three centuries was edited by Prof. Reithmayr of Munich (*Patrologia*, vol. i., Ratisbon, 1839). A Catholic biography of Möhler, by Reithmayr, is added to the 5th edition of his "Symbolism." The best Protestant biography, which is that of Prof. Kling of Marburg, likewise classes him among the greatest theologians of the century.

MOHS, FRIEDRICH, a German mineralogist, born in Gernrode in 1774, died in Agordo, Lombardy, Sept. 29, 1839. He is known as the inventor of a new system of classification for minerals, which regards, in the collecting of species into higher groups, only their external characteristics. He left various works on mineralogical subjects.

MOIDORE, an old gold coin of Portugal, valued at £1 6s., or about \$6. There are also half and quarter moldores.

MOIGNO, FRANÇOIS NAPOLEON MARIE, a French clergyman and scientific writer, born in Guéméné, Morbihan, April 20, 1804. He studied under the Jesuits, became a member of their order, and in 1836 was appointed to the chair of mathematics in one of the Jesuit establishments in Paris. He became so deeply interested in scientific pursuits, that during the publication of his "Lessons in Differential and Integral Calculus" (2 vols. 8vo., 1840), being ordered by his superior to abandon his studies and accept the professorship of history and Hebrew in the university of Laval, he refused to obey, and after 4 years of dispute left the order. In 1845 he took charge of the scientific department in the *Époque* newspaper, and travelled through Europe as correspondent for that journal. He held similar positions on the staff of *La Presse* and of *Le Pays*. In 1848 he was appointed by M. Sibour chaplain of the lyceum of Louis le Grand. He has published a *Traité de la télégraphie électrique* (1849); *Épertoire d'optique moderne* (1850); and essays *Sur le stéréoscope* and *Sur le saccharimètre* (1853). In 1852 he founded *Cosmos*, an encyclopædic review.

MOIR, DAVID MACBETH, a Scottish author, born in Musselburgh, Jan. 5, 1798, died in Dumfries, July 6, 1851. He was educated at the grammar school of his native town, and at the age of 18 was apprenticed to a medical practitioner named Stewart for a term of 4 years, after the expiration of which he attended medical lectures at the Edinburgh university, and obtained a diploma as surgeon in 1816. At first he intended to enter the army, but abandoned that plan, and in 1817 formed a partnership with Dr. Brown in Musselburgh. He worked hard in his profession, and spent his nights in literary pursuits, contributing both in prose and verse to Constable's "Edinburgh Magazine" and to "Blackwood." His serious poems were signed with the Greek letter Δ , and hence he was more commonly known to readers by the designation of Delta. In 1824 he published "The Legend of Genevieve, with other Tales and Poems," and in the same year began in "Blackwood" a serial novel, "The Autobiography of Mansie Wauch," which became very popular. His marriage took place in 1829. In 1831 he published a work on the "Ancient History of Medicine," and in 1843 another volume of poetry called "Domestic Verses," which contains some of his best known poems. In 1846 he met with an accident which made him lame for life. In 1851 the Edinburgh philosophical association invited him to deliver a course of 6 lectures on the "Poetical Literature of the Past Half Century," which were afterward published; and in the same year he made his 370th and last contribution to "Blackwood." A selection of his poetical contributions, together with a memoir by T. Aird, was published in 1852, and a new and complete edition of his works in 1857. Notwithstanding Dr. Moir's literary activity and celebrity, he adhered through life to his profession, having a large practice as the leading physician of Musselburgh, and writing only at odd moments and late at night. He died at Dumfries while on a tour of relaxation.

MOIRA, EARL OF. See **HASTINGS, FRANCIS.**
MOKANNA, or MOCANNA. See **ATHA BEN HAKIM.**

MOLA. I. **PIETRO FRANCESCO**, an Italian painter, born in Coldre, duchy of Milan, in 1612 or 1621, died in Rome about 1668. He was a pupil of Cesare d'Arpino and Albano. Establishing himself in Rome, he was much employed by Innocent X. and his successor Alexander VII., as also by Queen Christina of Sweden. Mola was a good colorist, and designed with correctness and taste. He was one of the best of the Italian landscape painters. II. **GIAMBATISTA**, a painter, sometimes erroneously called a brother of the preceding, born in France about 1620, died in 1661. He studied in Paris, and subsequently under Albano at Bologna. He excelled in landscapes.

MOLASSES (Fr. *mélasse*), the sirup which remains in the manufacture of brown sugar, after separating from the juice all the saccharine matter that can be made to crystallize to advan-

tage. "Sugar house" molasses is the sirup which remains in the conversion of brown into refined sugar, and contains too little cane sugar to repay its further treatment. By fermentation and distillation molasses mixed with the skimmings of the sugar boiling is made to produce rum. (See **SUGAR**).—The imports of molasses into the United States in the year ending June 30, 1859, chiefly from Cuba, reached nearly 38,000,000 gallons, valued at about \$5,000,000, mostly used for home consumption.

MOLBECH, CHRISTIAN, a Danish scholar and author, born in Sorøe, Oct. 8, 1788, died in Copenhagen in June, 1857. He passed from the university of Copenhagen to a position in the royal library in 1804, of which he became chief librarian in 1823, when he became also professor of literary history in the university. In 1811-'13, and again in 1819 and in 1830, he travelled in the principal countries of Europe. From 1830 to 1842 he was one of the directors of the royal theatre, and as dramatic censor sought to raise the national stage to a more artistic character. The list of his writings, and of the reviews of them, in Erslew's *Forfatter Lexicon*, occupies over 11 closely printed pages. His work on bibliography has been translated into German, and is considered one of the best on the subject.—His son, **CHRISTIAN KNUD FREDERIK**, born July 21, 1821, has held an office in the royal library since 1843, and since 1858 has been professor of literature at Kiel. He has published lyric poems, a dissertation on statuary, a drama entitled *Dante*, and a lively narrative of travels in Spain.

MOLDAU, a river of Bohemia, which rises in the Bohemian forest, on the frontiers of Bavaria, flows in a S. E. direction as far as Rosenberg, and then pursues a N. course to Melnik, opposite to which town it falls into the Elbe. It is about 300 m. long, and for nearly half its course is navigable. Its chief tributaries are the Luschnitz, Sazava, Beraun, and Wattawa. The principal towns on its banks are Rosenberg, Budweis, and Prague. Vessels of 60 tons burden can ply on it to Prague.

MOLDAVIA (Turk. *Bogdan*), a country of Europe belonging to the Turkish empire, and now together with Wallachia forming the vassal state of the Danubian principalities. It is situated between lat. 45° and 49° N. and long. 25° and 29° E., and is bounded N. E. and E. by Bessarabia, from which it is separated by the Pruth, S. by the Bulgarian district of Dobrodja and by Wallachia, being separated from the former by the Danube, W. by Transylvania, and N. W. by Bukovina; area, including the lately reannexed districts of Bessarabia, 18,400 sq. m.; pop. in 1860, 1,400,000. It is traversed in the N. and W. by various offshoots of the eastern Carpathians, through which several passes lead into Bukovina and Transylvania. The principal rivers are the Danube, which during its short course on the S. boundary receives the waters of all the others, the Pruth, and the Sereth. The chief affluents of the Pruth are the Baglui and Shisha;

of the Sereth, the Bistritza, Moldava, Milkov, and Birlat. The largest lake is between the mouth of the Pruth and Sereth, in the S. E. corner of the country. Moldavia is rich in pastures, and produces wheat, maize, and other grains; excellent melons, which form a considerable part of the food of the peasantry; wines of various kinds, some of which rival those of Hungary; fruits, honey in great abundance, and several minerals, among which salt holds a prominent place. The forests contain bears, wolves, lynxes, and the aurochs, and yield excellent timber; the rivers abound in fish. Locusts often appear in destructive multitudes. The climate is rough in winter, but pleasant in summer. The inhabitants consist of Moldavians proper, of the Wallach race, Greeks, Armenians, Jews, Csángó-Magyars, Franks, and gypsies. The dominant religion is the orthodox Greek. The general language is the Wallachian, in which the preponderant Latin or Romanic element is largely mixed with Slavic, Turkish, and Tartar words. Agriculture, horticulture, and grazing are the principal occupations of the inhabitants, manufactures being almost entirely undeveloped, and commerce almost exclusively in the hands of the Greeks, Armenians, and Jews. Wine, honey, wax, cattle, hides, horses, and timber are the chief articles of export. The country is divided into Upper (or western) and Lower (or eastern) Moldavia, and subdivided into 18 *stinuts* (districts) and 64 *okols* (circles). The most important towns are Jassy, the capital and seat of the Greek archbishop, on the Baglni; Galatz, the chief emporium, on the Danube; Fokshany, on the Milkov; Roman, on the Sereth; Bakeu, on the Bistritza; and Botashany, on the Shisha. Moldavia is ruled by a hospodar (now sovereign of both the Danubian principalities), under the suzerainty of the Porte, and the protectorate of the great European powers. He is elected for life by the boyars or nobles, and limited by a divan or senate and a legislative assembly. He appoints the ministers. There is a civil, commercial, and canonical code. The military force consists chiefly of militia. The most influential class of citizens is that of the boyars, who enjoy ample privileges, and also represent the political life of the people. Education, in general, is still in its infancy. (For further details on the constitution and the financial and literary condition of the united principalities, see WALLACHIA, and WALLACHIAN LANGUAGE and LITERATURE.)—In ancient times the country, which at various periods of its history extended beyond its present limits, was occupied by the Getæ. Darius Hystaspes invaded it on his expedition against the Scythæ. It was subsequently an object of contention between the Scythæ and the rulers of Macedonia. In the latter part of the 1st century it belonged to the Dacian kingdom of Decebalus. Parts of it were attached, after his defeat, to the Roman province of Dacia. During the great migration of northern nations it was successively invaded by the Goths, Huns, Bulgarians, and Slavic tribes.

The Avars became dominant in the 6th century, but had soon to yield to the Bulgarians and their allies. After a few centuries the Bulgarians were overpowered by the Khazars, Petchenegs, and others. The latter tribes successfully warred with the Magyars, but continual dissensions prevented the inhabitants of the country from forming a well organized state, and the introduction of Christianity in the 11th century was almost without effect. Wars with the Greeks depopulated the country, which was soon after invaded by the Cumanians. These were in their turn subdued by the Mongols. Toward the close of the 18th century the inhabitants consisted chiefly of disunited Tartar, Cumanian, Petcheneg, Greek, Italian, and Wallach elements. In the earlier part of the following century a new Wallach immigration took place from Hungary under Bogdan, who together with his son Dragosh succeeded in establishing a dynasty of waywodes known in history under the name of the Dragoshites. The country now received the name of Moldavia from the river Moldava. The Greek creed was made predominant. But conflicts for the succession, insurrections, conspiracies, fratricidal feuds of every description, combined with external wars against Russians, Lithuanians, Poles, Crimean Tartars, Hungarians, Wallachians, and Turks, to make the long reign of the Dragoshites one of the bloodiest in history. One of the most warlike princes of the period was Stephen VI., surnamed the Great, son of Bogdan II., who died in 1504; but his son and successor Bogdan III. was unfortunate in his wars against the Hungarians and Poles, and having also suffered an invasion of the Tartars, he submitted himself to the suzerainty of the Porte. Bogdan's son, Stephen VII., leaned toward the Christian powers; but his successor, Peter VI., an illegitimate son of Stephen VI., allied himself closely with Sultan Solymán the Magnificent during his expedition against Vienna, receiving the acknowledgment of princely dignity in exchange for tribute. Moldavia was now a vassal province of the Ottoman empire, and soon after lost its eastern division, situated between the Pruth and Dniester, and now known as Bessarabia, which was constituted a separate Turkish province. This part was subsequently often reannexed and again detached. The suzerainty of the Porte little if at all ameliorated the condition of the distracted country. Civil wars, assassinations of the rulers, insurrections, depositions, and restorations were common events. For some time the boyars exercised the privilege of electing the waywodes. Later, however, the sultans were called upon to appoint them. Waywodes of various nationalities were now successively appointed, but their rule proved as inefficient in establishing a permanent condition of subjection, as it was distasteful to the boyars. One of the more distinguished foreigners was Basil Lupulo, a Greek of Epirus, who promoted civilization and science, but was deposed in the middle of the 17th cen-

ture, during the latter part of which, as well as in the following period, Fanariote Greeks mostly succeeded each other under the title of hospodar or prince. The principal families from which hospodars were selected were those of the Cantacuzenos, Cantemirs, Ducas, Rakovitzas, Mavrocordatos, Ghikas, and Ypsilantes. Of neighboring states, Poland and Transylvania having lost their influence over Moldavian affairs, Russia now became the most important. Most of the Fanariote hospodars leaned toward it, some of them secretly conspiring with Peter the Great and his successors. In the Turko-Russian wars which now followed each other, Moldavia was a principal object of contention. Peter the Great was near perishing with his army on the banks of the Pruth in 1711. In 1737 and 1738 Moldavia was more successfully invaded by the Russians under Münnich. In the first Turkish war of Catharine II. it was occupied by Rumianzoff and Panin, and organized as a Russian province, but restored to Turkey by the peace of Kutchuk Kainarji (1774), which, however, secured to Russia a kind of protectorate. Soon after, Moldavia, which had in the meanwhile been robbed of various important places, converted into Turkish fortresses, also lost its northern district, the Bukovina, which was claimed on trivial grounds and annexed by Austria (1777). The same power afterward combined with Russia for a new attack on Turkey, and Moldavia again became a seat of war. Leopold II., the successor of Joseph II., terminated the war by the peace of Sistova in 1791, Catharine II. more advantageously by that of Jassy in the following year. The succeeding Turkish wars were closed by the treaties of Slobosia (1807) and Bucharest (1812), by the latter of which the czar Alexander gained Bessarabia. The Greek insurrection under Ypsilante was a source of terrible suffering to the province. The treaty of Akierman (1826) restored the right of electing hospodars, for 7 years, to a divan of boyars, the Porte retaining the right of confirmation, and Russia its protectorate. The subsequent war of 1828 again brought Moldavia, as well as Wallachia, into the hands of the Russians, who occupied it, under Kisseleff, even after the peace of Adrianople (1829), which excluded all Turks from a permanent abode in it, a new statute being elaborated by a commission of boyars. This being confirmed by the Porte, the Russian army left the principalities, and Michael Sturdza, a native boyar, was elected hospodar of Moldavia for life. To unite the two principalities, as an independent Dacian or Rouman state, became now the chief tendency of the national party. Sturdza often gave umbrage to the representatives of Russia, and a revolutionary outbreak in Wallachia in 1848 was again followed by a Russian occupation. A new treaty was concluded by the Porte and the czar Nicholas at Balta Liman in 1849, in consequence of which Sturdza resigned his office, and another boyar, Gregor Ghika, was elected hospodar for 7 years. The war of

1853 destroyed the new basis. The Russians again occupied the principalities, but the military events on the Danube and in the Crimea compelled their troops to evacuate them, when they were occupied by the neutral armies of Austria. The peace of Paris in 1856 referred the affairs of the principalities, which were to be united, to a conference at Paris of the representatives of the great powers, the Porte, and Sardinia, which, in Aug. 1858, finally agreed on a new plan of organization. Soon after Alexander Couza was elected hospodar for life in both principalities, which being an unexpected event, as two elections were anticipated in accordance with the protocol of the conference, led to new complications. The influence of France, however, prevailed, in favor of the tendency to national union, and the election was confirmed by the Porte, and acknowledged by all other parties. (See WALLACHIA.)

MOLE, the name of many insectivorous mammals of the family *talpida*, embracing several genera agreeing in having a stout, thick, clumsy body, without visible neck, no external ears, minute auditory foramina, very small eyes, short limbs, anterior much the broadest and largest, with strong claws, short tail, and soft, velvety, and compact fur. Moles are generally distributed over the earth, except in South America and within the tropics, though the genera are closely restricted within certain regions; thus *talpa* is found only in Europe and Asia, *scalops* and *condylura* in North America, *chrysochloris* in Africa, and *urotrichus* in Japan and N. W. America. In *talpa* (Linn.) the dentition is: incisors $\frac{1}{1}$, canines none, and molars $\frac{1}{1}=\frac{1}{1}$, the first of the molars representing a canine (the upper in front of the lower), and the last 8 tuberculate; by some writers the 4th tooth on each side in each jaw is called a canine, which would make the teeth equal in number and alike in kind in both jaws. The nose is lengthened, truncate at the point; feet 5-toed, the soles of the fore feet turned backward, with toes connected and strong claws. The European mole (*T. Europaea*, Linn.) is 5 or 6 inches long, with a tail of 1 inch; the fur is very fine, of a blackish color; the bones of the fore limbs are very short and strong, supported by firm clavicles, and ending in a shovel-shaped hand, strengthened by the elongated falciform carpal bone, armed with large claws, and moved by muscles of great power; the sternum is keeled for the attachment of the pectoral muscles, the principal ones employed in digging their burrows; the muscles of the head are also powerful assistants in loosening the earth as the animal pursues its underground passage, preparing the way by its pointed, movable, hog-like snout. The senses of smell, hearing, and touch are very acute, in accordance with its subterranean mode of life. The eyes are 2 black glittering points, of about the size of mustard seed, concealed and protected by the surrounding skin and hairs. The popular belief that the mole is blind is an error; the mole of Greece mentioned by Aristotle as blind is either

the species *T. caeca* (Savi), in which there is no visible ocular fissure, or perhaps a burrowing rodent or rat-mole (genus *spalax*, Guld.), in which the very small eyes are hidden under the hairy skin. The openings of the ears and mouth may be closed by membranous folds to prevent the entrance of earth; the vent is considerably prolonged upon the tail. For interesting peculiarities in the reproductive system, see article "Insectivora" in the "Cyclopædia of Anatomy and Physiology." The food of the mole consists of worms, insects, and tender roots, in search of which it burrows in the ground; these excavations also serve as a place of residence and as a highway of travel from one field to another; its abode is in some firm hillock in a secure situation, in which are 2 circular galleries communicating with each other, the chamber being excavated in the centre of the lower gallery; these communicate by intricate passages with the high road, through which the animal passes with considerable speed, though very slow-moving on the surface of the ground; the road is placed at a depth of from 4. to 14 inches, according to its exposure to pressure from above. The mole frequently comes to the surface for the purpose of getting rid of the loosened earth, thus forming the little heaps known as mole hills; it is very voracious, and is soon killed by hunger; it is active all winter, though at a depth of a foot or more, and in summer at night frequently seeks its prey at the surface; it is a good swimmer; when irritated it bites severely, and the males in the love season often engage in deadly combats. The colors vary somewhat, and individuals are seen of white, ash, or fawn color; the soft fur is manufactured into light robes and very fine hats, and has been employed for artificial eyebrows. This industrious miner is frequently very detrimental to cultivated lands, but the loss is more than counterbalanced by the destruction of noxious insects and weeds. Four or five young are produced at a time, twice a year, in spring and autumn. This mole is generally distributed over Europe and Asia.—The golden moles of Africa (*chrysochloris*, Lacép.) have incisors $\frac{3}{8}$, the middle lower ones small and narrow, and molars $\frac{7}{8}$; the eyes are covered by skin, nose naked and leathery, fore feet 4-toed, with 4th toe very small, hind feet 5-toed, and no tail. The best known species (*C. Capensis*, Desm.) is of a brownish color with green and golden reflections; it inhabits the Cape of Good Hope, and has the form, size, and habits of the mole.—The star-nosed mole of North America (*condylura*, Illiger) has the end of the nose surrounded by 22 movable fleshy filaments, radiating in the form of a star, which serve as delicate organs of touch; the incisors are $\frac{3}{8}$, the upper middle ones broad, the lower ones procumbent, canines $\frac{1}{2}$, molars $\frac{7}{8}$; eyes very small; feet 5-toed; tail moderate, thinly haired. The *C. cristata* (Desm.) is about 4 inches long from tip of nose to base of tail, the latter being 8 inches more; it has the general

form of the moles; the hands resemble those of terrapins, and with the hind feet (considerably larger) are furnished on both surfaces with a covering of brown scales, with a horny tubercle on the inner edge of the soles; the under surface of the fingers is extended into fringed horny processes. The fur is rather coarse, of a sooty brown color; it is found in the northern parts of America from the Atlantic to the Pacific.—The most common American moles belong to the genus *scalops* (Cuv.), called also shrew moles from the resemblance of their dentition to that of the shrews; the incisors are $\frac{3}{8}$, canines $\frac{1}{2}$, molars $\frac{5}{8}$; in *scapanus* (Pomel), set apart for the Oregon and hairy-tailed moles, the incisors are $\frac{3}{8}$, canines $\frac{1}{2}$, and molars $\frac{7}{8}$. In the common mole (*S. aquaticus*, Cuv.) the teeth are 86, the eyes not covered by integument, tail nearly naked, and feet fully webbed; the color is dark plumbeous, with sometimes a brownish tinge, and the feet and tail are white; it is between 4 and 5 inches long, with the tail about an inch; it is found from Canada to Florida, and as far west as the Mississippi. The silver mole (*S. argentatus*, Aud. and Bach.) is a larger species of a silvery plumbeous color, found on the western prairies. The Oregon mole (*S. Townsendii*, Bach.) has 44 teeth; it is nearly black, with purplish or brownish reflections; it is about 5 inches long, with a tail of $1\frac{1}{2}$ inch. The hairy-tailed mole (*S. Brewerii*, Bach.) is dark plumbeous, glossed with ashy brown; it is about $5\frac{1}{2}$ inches long, and found in the New England and middle states.—The genus *urotrichus* (Temm.) has incisors $\frac{3}{8}$, canines $\frac{1}{2}$, and molars $\frac{7}{8}$; the muzzle is prolonged into a cylindrical tube terminating in a naked bulb; tail short and hairy. A common species in Japan is the *U. talpoides* (Temm.), smaller than the common mole. A species (*U. gibbei*, Baird), $2\frac{1}{2}$ inches long, occurs in Washington territory.

MOLE, LOUIS MATHIEU, count, a French statesman, born in Paris, Jan. 24, 1780, died Nov. 25, 1855. He belonged to a family which had long occupied distinguished places in the French magistracy. His father, President Molé, lost his life during the first French revolution, and the son passed most of his childhood with his mother in Switzerland and England. Returning to France in 1796, he studied at the central school of public works, afterward called the polytechnic school, and in 1806 published his *Essais de morale et de politique*, in which he defended absolutist theories in politics with an ability which commanded immediate attention. Fontanes, editor of the *Journal de l'empire*, presented him to Napoleon, who, anxious to identify with his government the influential names of the old monarchy, appointed the young author auditor and soon afterward master of requests in the council of state. In 1807 he represented the emperor in the grand sanhedrim of the Jews assembled to draw up a code of doctrine for their people, and in the same year he was made prefect of the department of Côte d'Or. About this time he wrote an *éloge* on his

ancestor Mathieu Molé, president of the parliament of Paris during the wars of the Fronde, the tenor of which was well fitted to further his prospects of advancement. He became councillor of state and director-general of bridges and roads, and in 1818 pronounced a glowing panegyric on the emperor before the *corps législatif*, for which he was rewarded in September of the same year with the post of *grand juge* (minister of justice), and the titles of count of the empire and commander of the order of *réunion*. While Napoleon was absent with the army, the count acted as one of the council of regency, remaining faithful to his post until the last moment, and attending the empress Maria Louisa in her flight to Blois on the approach of the allied armies to Paris in 1814. Released from his allegiance by the emperor, who advised him to serve the new régime as faithfully as he had served him, Molé gave in his adhesion to Louis XVIII., and was called to the municipal council of Paris. On Napoleon's return from Elba, he refused to sign the declaration of the council of state against the Bourbons, though he retained his office as director of bridges and roads and was made a peer of France. On the second restoration he was re-nominated to the council of state and confirmed in his peerage; but he never enjoyed the full confidence of Louis XVIII., and had but little influence in the government. Although he voted for the execution of Ney, he exerted himself to the utmost to save other victims of the royalist reaction. In May, 1817, he became minister of marine in the cabinet of the duke of Richelieu, and took an active part in all the measures of the administration. Resigning with the majority of his colleagues in Dec. 1818, he remained out of office until the accession of Louis Philippe, who appointed him minister of foreign affairs, Aug. 11, 1830. The ministry, formed by a coalition of parties in which Count Molé represented the bourgeoisie interest, fell to pieces in less than 8 months, the ostensible cause of rupture being the refusal of the king to dismiss Odilon Barrot from the prefecture of the Seine. In Sept. 1836, after the overthrow of the Thiers ministry, Molé returned to power as premier and minister of foreign affairs, at the head of a cabinet based on the principle of non-intervention in the affairs of Spain, and composed chiefly of *doctrinaires* and conservatives, with M. Guizot as minister of public instruction. By the exclusion of Guizot and the *doctrinaires* in the following April, he found himself the leader of the most conservative ministry of any since the revolution of 1830, and face to face with a powerful opposition, of which Thiers and Guizot were the recognized heads. He negotiated the marriage of the duke of Orleans, and procured an amnesty for political offenders; but several unpopular measures, such as the dotation of the duke of Nemours, and the proposed "law of disjunction," providing that when certain crimes had been committed by soldiers and civilians jointly, the former should be tried by

military and the latter by the civil courts, had prepared the way for the victory of the Thiers and Guizot coalition; and after twice dissolving the chambers, Molé was forced to resign, in March, 1839. In the following year he was chosen a member of the academy. At various times he was invited to form a cabinet, but did not succeed; and throughout his career he enjoyed the warm personal regard of Louis Philippe, who in 1837 conferred upon him the grand cross of the legion of honor. At the time of the revolution of 1848 he withdrew from public affairs, but without solicitation was chosen to represent the department of Gironde in the constituent assembly, where he placed himself among the leaders of the right. In this body, as well as in the legislative assembly, to which he was elected in 1849, he exerted no inconsiderable influence, although he seldom took part in debate. He was a member of the committee which framed the law of 1850 against universal suffrage, and was reckoned among the supporters of government until the course of the ministry began to run counter to the monarchical interests with which he was both by principle and hereditary association identified, when he went over to the opposition, and was one of those who protested to the mayoralty of the 10th arrondissement against the *coup d'état* of Dec. 1851. The close of his life was passed in retirement at his ancestral chateau of Champlâtreux. In politics Count Molé combined a certain proportion of liberal ideas with the high-bred tone and absolutist principles of the statesmen of the old régime. He belonged to the ultramontane party in religion, and was one of the staunchest supporters of the Roman Catholic church in France. A vast fund of historical information, a talent for debate, unaccompanied however by remarkable eloquence, industrious habits, and a grave, aristocratic bearing, gave him great influence in the chamber of peers; but, as Alison remarks, "he was better acquainted with France as it had been than as it was—a fault common to him with many aristocratic leaders, and which has led to many of the most unfortunate steps recorded in history."

MOLE CRICKET, a jumping orthopterous insect, of the family *achetada*, and genus *gryllotalpa* (Latr.), meaning cricket mole. The European mole cricket (*G. vulgaris*, Latr.) has a most extraordinary and ugly form; it is nearly 2 inches long and $\frac{1}{4}$ of an inch wide, and of a dark brown color; the head, retractile within the prothorax, has 2 long and strong antennæ in front of its black reticulated eyes; the thorax is elevated and crab-like, covered with a velvety down; the wings, which when expanded are broad and triangular, when folded extend like 2 ribbons over the abdomen; the abdomen, soft and with 9 or 10 segments, has 2 filaments at the end as long as the antennæ; the fore legs are short, broad, and strong, the shanks being very wide, flat, and 8-sided, with 4 finger-like projections on the lower side, giving very much

the appearance and the digging powers of the hands of the mole, whence the generic name. The female lays 200 or 300 eggs in June in a gourd-shaped hollow in the earth, about 2 inches long, having a winding communication with the surface; the young are hatched in 5 or 6 weeks, and resemble black ants, not arriving at maturity till the 8d year; both young and old commit great ravages by feeding on the tender roots of grass, culinary vegetables, and flowers; they also eat insects and worms, and themselves furnish food for moles, lizards, snakes, and other insectivorous animals. The males emit a pleasing sound at night, at which time they are the most active. Rösel says this insect can push forward on a level surface a weight of 6 lbs. with its fore feet, indicating the power which it can exert in digging its subterranean passages. They rarely appear on the surface, but their presence may be known by the withered patches in the field and garden, and their retreats detected by the little hills of fresh earth, smaller than those of moles, which they throw up in soft and moist places. Late in the autumn they bury themselves deep in the ground, coming again to the surface in the warm days of spring. The surest way to prevent their depredations is to dig up the nests and destroy the eggs; other ways are to pour boiling water or oil into their holes. The American species (*G. brevipennis*, Serville) is about $1\frac{1}{2}$ inch long, of a bright bay or fawn color, with the wing covers not $\frac{1}{2}$ the length of the abdomen, and the tips of the folded wings extending only $\frac{1}{2}$ of an inch beyond the covers. They have not yet proved very destructive in this country; if, as cultivation is extended, they should be injurious to vegetation, in addition to the above remedies, grated carrots or potatoes mixed with arsenic may be placed near their burrows, or swine be permitted to root them up. The *G. didactyla* (Latr.), having only 2 finger-like projections on the fore legs, has proved very destructive to the sugar cane in the West Indies and South America.

MOLESCHOTT, JACOB, a Dutch physiologist and naturalist, born in Bois-le-Duc, Aug. 9, 1822. He studied at the gymnasium of Cleves, Prussia, where Moritz Fleischer familiarized him with the philosophy of Hegel, and in 1842 went to Heidelberg, where Tiedemann and Bischoff were his teachers in physiology and Delffs in chemistry. Physiology and anthropology became his favorite pursuits, though he continued to devote his attention to the Hegelian philosophy, and published in 1842 a Dutch translation of Karl Snell's *Philosophische Betrachtungen der Natur*. The university of Haarlem conferred in 1844 its principal medal upon his *Kritische Betrachtung von Liebig's Theorie der Pflanzenernährung* (Haarlem, 1845); and on Jan. 22, 1845, he obtained his diploma as doctor of medicine, surgery, and midwifery from the faculty of Heidelberg, when he produced a dissertation entitled *Ueber den Bau der Lungen*. In May, 1845, he returned to his native country, establishing himself as a physician

at Utrecht. At the same time Mulder's celebrated chemical laboratory in that city gave him opportunities of experimental labors in that science, while he continued to pursue physiological investigations in concert with his friend Donders, the results of which were embodied in the *Holländische Beiträge zu den anatomischen und physiologischen Wissenschaften*, by Van Deen, Donders, and Moleschott (Düsseldorf and Utrecht, 1848). The study of the writings of Feuerbach and of his countryman Spinoza brought him into conflict with the system of Hegel, and he gained the conviction that the philosophy of the universe can only be satisfactorily explained by the light of the natural sciences, and not by that of abstract metaphysical speculation. With a view of disseminating his principles, he returned to his *alma mater* in 1847, at first teaching physiological chemistry and dietetics, and afterward experimental physiology, anthropology, and general and comparative anatomy. His activity as a lecturer and writer inaugurated in Heidelberg a new era in the study of physiology. According to Moleschott, man is a chemical compound, and his condition is determined by his food and other external circumstances; and hence he regards the study of dietetics as a principal step to the formation of a more comprehensive system of anthropology. These views, which he illustrates by the latest investigations of all branches of modern science, have caused him to be called a materialistic philosopher, although he differs from Hegel only in the interpretation of inorganic nature, which he regards as indissolubly united with spiritual forces. With Moleschott all phenomena of the universe are animated by spiritual as well as by material life, and have been so from the dawn of time. The fearless advocacy of his views brought him into collision with the government of Baden, and about a year after Kuno Fischer's dismissal on account of his pantheistic principles, Moleschott's teachings were also arraigned (1858); but on this occasion he was supported by the medical faculty of Heidelberg, and the physiological laboratory which he had founded in the summer of that year, as an institution independent of the university, continued to be crowded with pupils. In 1854, however, the government renewed its persecution, and he was accused of propounding precepts dangerous to religion and morals. He protested against this imputation, and declared it to be the highest moral duty of the teacher to expound truth with the utmost frankness and independence. At the same time he relinquished his place in the university. On Aug. 6 he received a brilliant ovation from his principal pupils, who in vain called upon the government to specify the charges against the professor, and who continued to attend his lectures in his private laboratory until the autumn of 1855, when he removed to Zürich, and on June 2, 1856, assumed a professorship in the newly founded federal polytechnic school with a remarkable discourse, entitled *Licht und Le-*

ben (Frankfort, 1856), of which a 2d edition appeared in 1857. He is still (1860) professor of physiology in that institution, and at the same time practises his profession. Dr. Moleschott has largely contributed to the *Zeitschrift für rationelle Medecin*, *Archiv für physiologische Heilkunde*, *Müller's Archiv*, *Natur*, &c.; and he founded in 1856 a new physiological review under the title *Untersuchungen zur Naturlehre des Menschen und der Thiere*, which is published at Frankfort-on-the-Main. Among his principal works are: *Physiologie der Nahrungsmittel, ein Handbuch der Diätetik* (Darmstadt, 1850; 2d ed., 1857-'8); *Lehre der Nahrungsmittel* (Erlangen, 1850; 3d ed., 1856); *Physiologie des Stoffwechsels in Pflanzen und Thieren* (Erlangen, 1851); *Kreislauf des Lebens: physiologische Antworten auf Liebig's chemische Briefe* (Mentz, 1852; 3d ed., 1856); and *Georg Forster, der Naturforscher des Volkes* (1854; new ed., 1857). He has also translated into German from the Dutch Mulder's essay on chemical physiology, and is now (1860) said to be engaged on an elaborate work on anthropology.

MOLESWORTH, SIR WILLIAM, an English statesman, born May 23, 1810, died Oct. 22, 1855. He studied at Cambridge and Edinburgh, and afterward in Germany, made the tour of the continent, and returned to England in 1831. He was returned to parliament for East Cornwall in 1832, reelected in 1834, and in 1837 was a member for the city of Leeds, but retired in 1841, and devoted himself to the study of politics and social economy. In 1850 he was returned to parliament by the borough of Southwark, and continued to represent that constituency until his death. He was known as a philosophical radical in politics, and on the rise of the free trade party gave his influence in favor of that measure. On the formation of Lord Aberdeen's ministry in Jan. 1853, Sir William accepted the office of first commissioner of public works; and in July, 1855, he was appointed to the secretaryship of the colonies, but survived his appointment only a little more than 3 months. His speeches in parliament in the years 1837, '38, and '40 had shown an intimate acquaintance with the colonial system of England, and the London "Times" called him the "liberator and regenerator of the colonial empire of Great Britain." He was a frequent contributor to various periodicals and reviews, particularly to the London and Westminster review, of which he was for some years editor and proprietor in conjunction with John Stuart Mill. He edited and published at his own expense the first collection of the complete works of Thomas Hobbes (16 vols. 8vo., London, 1839-'45).

MOLFETTA (anc. *Respa*), a fortified seaport town of Naples, province of Bari, on the Adriatic, 16 m. W. N. W. from Bari; pop. 17,000. It is the see of a bishop, and has a cathedral, several other churches, a college, and a castle. Linen and saltpetre are manufactured, and small coasting vessels are built. In the vicinity are numerous oval caverns arranged in tiers, one

of which, called the Pulo di Molfetta, is 1,400 feet in circumference and 112 feet deep. Nitre abounds in all the caverns.

MOLIÈRE, the assumed name of JEAN BAPTISTE POQUELIN, the greatest comic poet of France, born in Paris, Jan. 15, 1622, died there, Feb. 17, 1673. He was both the son and grandson of *valets de chambre tapisseries* to the king, and aided his parents in this trade, to which he was himself destined, till his 14th year. His grandfather had a taste for theatrical representations, and occasionally took him to the hôtel de Bourgogne, where Bellerose then acted in genteel comedy, and Gauthier-Garguille and Turpin in farce. It was noticed that he always returned sad, thoughtful, and disinclined to business. The result was that he obtained permission to engage in study, and was sent in 1637 to the Jesuit college of Clermont in Paris, where he remained 5 years. He enjoyed the private lessons of Gassendi, who was combating Aristotle and Descartes, then the highest authorities in philosophy, and was associated with the prince of Conti, afterward his patron and friend, with Bernier, Hesnault, and Chapelle, all of whom became remarkable for their independence and philosophical humor. In 1642 he is said to have accompanied Louis XIII. on his journey to Narbonne, fulfilling his father's office, and to have witnessed on his way the execution of Cinq-Mars and De Thou. He soon after began to study law at Orleans, and was admitted an advocate in 1645; but his taste for the stage diverted him from the profession, and caused his return to Paris. The attractions of the actress Madeleine Béjart were reported also to have influenced his judgment. The example of Richelieu had created a general interest in the drama, and Poquelin became the head of a troupe of amateur comedians, which was soon transformed into a regular professional travelling company, known as *l'illustre théâtre*. He then assumed the name of Molière. Little is known of his life in the provinces, as strolling player, manager, and author, from 1646 to 1658, when he returned to Paris. He composed numerous slight 'pieces, imitations of Italian farces, some of which were the first sketches of his future comedies. At Bordeaux he was welcomed by the duke d'Épernon; at Lyons he obtained the accession of Mme. Duparc and Mme. De Brie to his company, which already included the brothers and sister Béjart; and at Pézenas there is still preserved the chair in which he was accustomed to sit every Saturday in a barber's shop to study the faces and conversation of the visitors, thus indicating the disposition for silent observation which increased with his years. His first regular comedy was *L'étourdi*, represented at Lyons in 1653, which is superior to those of Scarron and Scudéry that preceded it, and by its success induced the principal members of a rival company to join his troupe. He went thence to Béziers at the invitation of the prince of Conti, who was not yet a Jansenist, and who was so delighted

with *L'étourdi* and *Le dépit amoureux* that he vainly sought to engage Molière as his secretary to succeed the poet Sarrasin. At Avignon he was intimate with the painter Mignard. Having visited the principal cities of the south, he began to approach the capital, which he entered under the protection of Monsieur, duke of Orleans, in 1658. His first performance was the representation of Corneille's *Nicomède* and his own *Docteur amoureux* before the court and the comedians of the hôtel de Bourgogne, and was so satisfactory that his company was permitted to establish itself in Paris under the name of the *troupe de Monsieur*. It became the *troupe du roi* in 1665, and in 1680 was united with that of the hôtel de Bourgogne to form the *théâtre Français*. During the remaining 15 years of his life he produced more than 80 plays, half of which are masterpieces. He opened a new path in 1659 by his *Précieuses ridicules*, abandoning the traditions of the Italian and Spanish stage, and assailing the affectations encouraged in literature and society by coteries that ridiculously adopted the tone of the hôtel de Rambouillet. The price of admission was trebled on the second day, yet the play had a run of 4 months. The author was greeted from the pit by the cry of an old man: *Courage, Courage, Molière! voilà la vraie comédie*; a judgment confirmed by the public and by posterity. After witnessing its triumph, he declared that he no longer needed to study Plautus and Terence, but only the world. At brief intervals followed *Sganarelle, ou le cocu imaginaire* (1660), a somewhat scandalous farce; *Don Garcie de Navarre* (1661), which proved a failure; *L'école des maris* (1661), the leading idea of which is borrowed from the *Adelphi* of Terence, and in which the character of Sganarelle attains its fullest development; and *Les fâcheux* (1662), the first and one of the finest examples of a *comédie à tiroirs*, designed to be acted in the intervals of a ballet, and which was a principal attraction at Fouquet's famous and unlucky fête in the chateau of Vaux. In the same year occurred his marriage with Armande Béjart, a sister of the actress in his company, and whom the slanders of the time charged with being a daughter of his former mistress. The charge was however discredited by the king, who with Henrietta of England stood sponsors for his first child, and has been completely disproved by legal documents brought to light in 1821. His 3 next plays, *L'école des femmes* (1662), *La critique de l'école des femmes* (1663), and *L'impromptu de Versailles* (1663), successively increased the animosity against him, for which his own imprudence furnished the pretext. The first and second aroused the suspicions of the religious party, and gave rise to literary discussions like those which Corneille had caused by the *Cid* and Racine by the *Phédre*; and the third drew upon him the unscrupulous assaults of the rival troupe at the hôtel de Bourgogne. All who had suffered by his satire or been eclipsed by his success combined to cir-

culate libels. Montfleuri, who may be said to have discharged the functions of liar-general, vainly tried to make himself heard at court. Unfortunately the host of indecent stories were embodied in an anonymous volume entitled *La fameuse comédienne, ou histoire de la Guérin* (Frankfort, 1688), which gained the attention of Bayle, whose dictionary has led many subsequent writers to repeat or to refer to them. In 1664, at the brilliant fêtes of Versailles, Molière and his company contributed to the gayeties on 4 of the 7 days. He presented *La princesse d'Élide*, a romantic and gorgeous play, and the first 8 acts of *Tartufe*, a satire on hypocrites, which was deemed diverting at court, but the king forbade its representation in Paris. This ban stimulated public curiosity, and the piece was soon completed, and acted with great applause in Fontainebleau and other towns. The Jesuits and the Jansenists only made it the more effective by each contending that the other was the real object of attack. Vexed at the prohibition which deprived him of the approval of a Parisian audience, he treated a kindred topic in the comedy of *Le festin de pierre* (1665), which portrays the multiple character of Don Juan at once as atheist, libertine, and hypocrite. This was preceded by *Le mariage forcé*, directed against the theologians of the Sorbonne, and followed by *L'amour médecin*, which began the war with the medical faculty that he continued through life. He was now in the period of his most productive and highest power. Within the next 3 years followed *Le misanthrope*, which Frenchmen pronounce his *chef d'œuvre*, partly from its faultlessness of style, and partly from its portrayments of Alceste, who runs counter to the conventional, recognized, and therefore harmless hypocrisies of social intercourse, and of Oelime the coquette and Arsinoë the prude; *Le médecin malgré lui*, a rollicking farce, which had the greatest success; *Amphitryon*, an imitation of Plautus, in reading which Voltaire confesses to have tumbled from his chair convulsed with laughter; *L'avare*, exhibiting in the character of Harpagon the comical relations of avarice; and *Georges Dandin*, designed to expose the mischief resulting from ill-assorted marriages, especially from the union of ruined aristocrats and wealthy *parvenus*. His *Tartufe* was also once acted with signal applause at the Palais Royal, but its second representation was immediately forbidden, and within a week the archbishop had threatened excommunication against all who should act, read, or listen to it. It is the greatest effort of his genius, and those who take umbrage at it as bringing religion into ridicule have been advised to read it again, since they are probably among those for whose benefit it was intended. In the 4 years between the performance of *Tartufe* in Paris and the death of Molière, the less important pieces which he successively produced were the farce of *Monsieur de Pourceaugnac*; the *Amants magnifiques*, in which astrology is satirized; the

Fourberies de Scapin, containing the effective quotation: *Que diable alla-t-il faire dans cette galère? Psyché*; and *La comtesse d'Escarbagnas*. To this period belong two masterpieces, *Le bourgeois gentilhomme* (1670) and *Les femmes savantes* (1672), the former displaying the absurd conceit of plebeians in seeking the culture, manners, and acquaintance of the nobility, the latter aimed against pretenders to taste and science, who pride themselves upon what they neither possess nor understand. His dramatic career terminated with the *Malade imaginaire*. He had acted in its fourth representation, but his cough rendered the task difficult, and he returned to his chamber to die within an hour. Two sisters of charity, who had often experienced his hospitality, were by his side, but his eye vainly wandered to the door in hope of priestly consolation; and at first he was even refused burial in consecrated ground. "What!" said his widow, "refuse him sepulture! In Greece they would have raised altars to him." A multitude of anecdotes indicate the nobility and truthfulness of his nature, his scorn of every thing false, his unostentatious kindness and generosity. As an actor he attained high success by his tact and finesse, by dint of study and effort, despite physical disadvantages. He excelled in the most difficult parts, in those of Arnolphe, Orgon, and Harpagon, and in the original and typical characters of Mascarille and Sganarelle. Though the most inventive of comic poets, few writers have borrowed so freely from others. His imitations of Italian, Spanish, and Latin comedies are constant and undisguised, and are to be attributed to the occasional character of many of his pieces, written in the exigency of the moment at the command and for the entertainment of the court. The French maintain his superiority to all earlier and all later writers of comedy. La Harpe declares comedy and Molière synonymous terms; Chamfort calls him the most amiable teacher of humanity since Socrates, and believes that Julius Cæsar, who called Terence a half Menander, would have called Menander a half Molière; and even Hallam ventures to compare him only with Shakespeare, claiming that the latter had the greater genius, but admitting that the former wrote the better comedies. More than a century after his death (1778), the French academy, which had refused to receive him on account of his profession as comedian, decided to admit his bust into its chamber with the inscription proposed by Saurin: *Rien ne manque à sa gloire; il manquait à la nôtre.*—Among the best editions of Molière are those of Auger (9 vols., 1819-'25) and Aimé-Martin (8 vols., 1838-'6). The best biographies are by Taschereau (Paris, 1825; with supplement, 1827) and Barzin (1851).

MOLINA, LUIS, a Spanish Jesuit, born at Cuenca in 1585, died in Madrid, Oct. 12, 1600. He entered in early life the order of the Jesuits, and made his theological studies at Coimbra. Among his teachers was Peter Fonseca, who

inducted him into the doctrine of the *scientia media*, and who later, when the promulgation of this doctrine by his pupil began to agitate the theological world, confessed himself its author. Molina became later a distinguished professor of theology at Evora in Portugal, where he taught for 20 years. Among his works are: *De Justitia et Jure* (6 vols., Mentz, 1659); *Commentarii in Primum Partem D. Thomæ* (1598). But his principal work, which has immortalized his name in the annals of theology, is *Liberi Arbitrii cum Gratia Donis, Divina Præscientia, Providentia, Prædestinatione et Reprobatione Concordia* (Lisbon, 1588; an appendix, containing a defence of his doctrines, appeared the next year). The book came at once into general circulation, and editions of it were published at Lyons in 1593, at Venice in 1594, and at Antwerp in 1595. Molina affirms in it that the decree of predestination to eternal glory was founded upon a previous knowledge and consideration of the merits of the elect; that the grace from whose operations these merits are derived is not efficacious by its own intrinsic power only, but also by the consent of our own will, and because it is administered in those circumstances in which the Deity, by that branch of his knowledge which is called *scientia media*, foresees that it will be efficacious. By *scientia media* the theological schools understood that foreknowledge of future contingents that arises from an acquaintance with the nature and faculties of rational beings, of the circumstances in which they shall be placed, of the objects that shall be presented to them, and of the influence which their circumstances and objects must have on their actions. The doctrine of Molina was soon violently assailed, especially by the Dominicans, and it was even denounced to the inquisition at Valladolid. At length the controversy was brought before the pope, Clement VIII., who in 1597 appointed a congregation (*congregatio de auxiliis*) to investigate the matter. It was found that nearly the whole order of the Jesuits espoused the cause of their fellow member, while the Dominicans were just as unanimous in demanding the condemnation of his doctrines. The bishops who were consulted were divided in their opinions. The pope at length gave the decision, that both doctrines, that of Molina as well as that of his opponents, might be safely taught within the Roman Catholic church. A large majority of the Roman Catholic theologians have since declared against at least some of the points of Molina's system.—See Sotwel, *Bibliotheca Scriptorum Societatis Jesu*; Le Blanc (Dominican), *Historia Congregationis de Auxiliis* (Louvain, 1700), and on the other side, Theodorus Eleutherius (Jesuit), *Historia Controversiarum de Divina Gratia Auxiliis* (Antwerp, 1705); and Ranke, "History of the Popes," book vi. § 9 (London, 1853).

MOLINE, a village of Rock Island co., Ill., on the Mississippi river, and on the line of the Chicago and Rock Island railroad; pop. about

8,000. The river is here divided by an island 3 m. long, and from 16 m. above to 3 m. below the town are the Upper Rapids. By means of a dam built across to the Illinois shore immense water power is obtained, and employed for various manufactories, constantly increasing in number and importance. Near the village are large coal fields. It contains several mills and factories, 2 banking houses, and a fine school building with about 500 pupils, and maintains a weekly newspaper.

MOLINISTS, the designation of those Roman Catholic theologians who adopted the views of Molina on grace. Among them Toletus, Mariana, and Suarez are prominent. The name soon disappeared, as the controversy started by Molina was thrown into the background by others, involving the question of predestination and grace more deeply. (See **JANSENISTS**.)

MOLINOS, MIGUEL DE, a Spanish mystic, founder of the sect of quietists, born in the diocese of Saragossa in 1627, died in 1696. After studying at Pampeluna and Coimbra he was ordained priest, received the degree of doctor in theology, and in 1669 fixed himself at Rome, where he was held in high favor by the pope, and regarded as a man of extraordinary piety. In 1675 he published there in Spanish a work entitled "The Spiritual Guide," which was soon translated into many different languages, passing in the course of a few years through 20 editions. Its new theories of a religious life, which afterward obtained the name of "quietism," were received at first with almost universal favor. The author taught that little value was to be placed upon ceremonial observances, but spiritual perfection consisted in the perfect repose of all the faculties of the soul in God, and indifference to all the actions of the body. For those who attained this "fixed" or "continuous" state, there was no sin, and no occasion for anxiety. "Mystical theology," said Molinos, "is not a science of the intellect, but of sentiment; it is not learned by study, but received from heaven." He does not seem to deny the necessity of good works, but the Roman theologians soon detected heretical tendencies in a doctrine which made religion mainly to consist of sentiment. The perfect man of Molinos, according to a Catholic writer, is one "who reasons not; who reflects neither on God nor on himself; who desires nothing, not even his salvation; who fears nothing, not even hell; to whom the most impure thoughts, as well as good works, become absolutely extraneous and indifferent." The "Spiritual Guide" was condemned by Pope Innocent XI. in 1687, and the author, after making a public recantation of his errors, was committed to prison, where he passed the rest of his life. When his papers were seized, 20,000 letters were found from persons desiring his counsel in spiritual matters. His doctrines were taught in a somewhat modified form by Mme. Guyon, and were reheated faintly in Fénelon's "Maxims of the Saints."—See *Recueil des diverses pièces concernant le quêt-*

tisme, ou Molinos, ses sentiments et ses disciples (Amsterdam, 1688).

MOLLUSCA, a branch of the invertebrate animal kingdom, so named from the general softness of the body; some of its members were first defined by Aristotle under the name of *malakia* (soft animals), of which the Latin *mollusca* and English mollusk are rude equivalents. Cuvier, between 1792 and 1817, determined the characters and boundaries of this branch by investigation of its anatomical structure; before his time the study of the shells with which most mollusks are provided, or conchology, had occupied almost the exclusive attention of classifiers; after him conchology took its subordinate place as a department of malacology. (For the characters of the shells, and the systems of classification, see **CONCHOLOGY**, and **MALACOLOGY**.) The microscopic anatomy and embryology of mollusks led to the separation of cirripeds, and to their being placed among articulates in the class of crustaceans; for the same reason the *bryozoa* were taken from polyps and placed among acephalous mollusks. The mollusca (*heterogangliata* of Owen) include such animals as have one or more nervous ganglia below the entrance to the alimentary canal, from which radiate cords which form a collar around the oesophagus and supply the other organs of the body; in the higher forms other ganglia are added above the oesophagus and in an unsymmetrical manner in different parts of the body. Of course, only the principal features of this extensive branch can be alluded to here, and numerous special works are within the reach of most persons desirous of pursuing this study; in addition to the writers alluded to under **MALACOLOGY**, may be mentioned Poli, Rathke, Savigny, Chamisso, Pfeiffer, Deshayes, Forbes and Hanley, Loven, Quatrefages, Kiener, Chenu, Clemnitz, Rang, Alder and Hancock, Ferrussac, D'Orbigny, Philippi, Sowerby, Johnston, Martini, Huxley, Eschricht, and Delle Chiaje; and in the United States, Say, Conrad, Lea, Couthouy, Binney, Adams, Jay, Haldeman, and Gould.—Taking the mollusca as a branch of the animal kingdom, it may be said that the body is covered by a soft moist skin, in or on which a shell is usually secreted; many have no head distinct from the rest of the body; the organs of sense are comparatively slightly developed, and the movements slow. Respiration is effected usually by gills; a heart is generally present, receiving the blood from the gills, and distributing it by arterial tubes; the capillaries are wanting, and the veins are replaced by sinuses; the blood is commonly whitish or whitish blue. The developmental energies seem to have been expended chiefly in the perfection of those organs concerned in the preservation of the individual and the species; some mollusks are hermaphrodite and require mutual impregnation, and in others the sexes are distinct; most are oviparous; the eggs, often connected in bunches or adhering to each other by a gelatinous substance, have a

thin outer shell or chorion, sometimes of a horny consistence. The terrestrial species are few in number, compared with those of fresh, and especially of salt water. From the inferior degree of their development in the organs of animal life, many authors rank them below the insects in the animal scale; while others place some of the cephalopods very near the fishes from their possessing the rudiment of an internal skeleton.—In the lowest class of *acephala* or headless mollusks, we have the 4 orders of *bryozoa*, *brachiopoda*, *tunicata*, and *lamellibranchiata*. In the lowest of these, the *bryozoa*, are comprised small pedunculated animals, the margin of whose body is provided with vibratile cilia, for producing the water currents necessary to respiration and to the obtaining of food; these cilia are sometimes supported on long tentacular prolongations; the digestive cavity is distinct from the walls of the body, and can be traced as a canal from mouth to vent, both opening within the ciliated circle, being reflected upward; they propagate by buds and by free swimming ciliated gemmules. The name (Gr. *βρύον*, moss, and *ζωον*, animal) was given by Ehrenberg, who regarded them as highly organized polyps, from many of the species incrusting other bodies like moss; others have styled them ciliobranchiate and tubular polyps. All *bryozoa* seem to have both males and females on the same stem, the cells containing animals with eggs being apparently more numerous than those with spermatozoa; the muscular system is largely developed, serving principally to retract the animal within its cell. Milne-Edwards makes of these, with the *tunicata*, his sub-branch of molluscoids; they have been divided by Van der Hoeven into the families: 1, *stelmatopoda*, in which the tentacles are disposed in a zone around the mouth, as in the genera *eschara*, *flustra*, and *cellularia*; and 2, *lophopoda*, with tentacles set pedately on two arms, and numerous, such as *oriatatella*, *plumatella*, and *alcyonella*. These and the other acephalous orders are aquatic. The 3 other orders are established according to the modifications of the integument and the gills.—The *tunicata* are acephalous mollusks, including the ascidians and *salpæ*; they have no shells, but are enclosed by an elastic, cellulose, uncalcified integument, having 2 apertures; the circulation is peculiar in the phenomenon of venous blood at one time proceeding from the heart to the gills, and at another arterial blood from the gills to the heart, in the same vessels; respiration is effected either by a vascular ciliated pharyngeal sac, or by a ribbon-shaped gill stretched across the common visceral cavity; the nervous system presents a single ganglion, from which the nerves radiate; organs of feeling, sight, and even hearing, have been described in these animals; muscular fibres, both longitudinal and transverse, are well developed. In *salpæ* we have free swimming animals, drawing in water by one aperture and expelling it by another one opposite; they are numerous in the

Mediterranean and in the temperate parts of the ocean far from the shores, sometimes in innumerable quantities together, and are said to be phosphorescent at night; they sometimes occur singly, and sometimes in long chains or in rings; Chamisso concluded, from observing the living animals, that a generation of distinct *salpæ* alternates with one of those in a chain, the granddaughter coming to resemble the grandparent and not the mother; within the single individuals connected embryos were found, which, with other similar phenomena, led to the interesting work of Steenstrup on the "Alternations of Generation;" the solitary *salpæ* are sexless, and are propagated by internal germs or buds, and are inferior to the associated forms, which have reproductive organs; the latter produce each a single young one. The ascidians have a sac-like body, with 2 apertures generally near together; the branchial sac is large, the opening of the œsophagus situated at the bottom; they are mostly attached, and propagate both by eggs and buds, the male and female organs situated on the same individual. They are both simple and compound. Those young which originate from eggs move free in the early stage, and have a long tail which is lost when they fix themselves by the opposite extremity; in the compound forms, larvæ of this description may enclose a group of 8 united ascidians, by their division laying the foundation for a colony while yet free, capable of greater multiplication by further gemmation. Ascidians are found from the tropics even into the arctic regions, and some of the compound forms are brilliantly phosphorescent. The non-pedunculated single ascidians were known to Aristotle, and were called by him *tethuon*; sometimes called bagpipes, these animals are often seen attached to rocks, shells, crabs, and other bodies; though several may be found in a group, they do not form a compound body with a common external covering; they are occasionally found attached to a shapeless mass formed by the body of other ascidians. The food consists of small organic particles, which are brought with the water into the branchial sac and to the œsophageal opening at the bottom.—The brachiopods, or *palliobranchiata*, are also acephalous, with the body depressed, covered with a mantle, bilobed and open; the branchiæ are not separated from the mantle; the heart is double and arterial; near the mouth are 2 long spirally convoluted arms (whence the name of the order) provided with cirri or cilia; the mouth is simple, at the base of the arms; the shell is bivalve, always attached either by a peduncle or by the shell, and adheres to the mantle by several oblique muscles; there is no elastic ligament at the hinge of the shell, which is opened by the arms and by internal muscles; all are aquatic and marine. They include the *teredratulo*; the extinct spirifers, *orthis* and *productus*, with articulated calcareous shells; and the *crania* and *lingula*, the last interesting as occurring with slightly modified species and with few interruptions from the

silurian to the present epoch; a species of *lingula* has recently been discovered by Prof. Agassiz on the coast of South Carolina, the first on the American side of the Atlantic basin. *Lingula* live near the surface, but some *terebratula* dwell beneath a pressure of 60 to 90 fathoms of water, explaining the strength and complexity of some parts of these minute animals. The brachiopods were most abundant and varied in geological ages, and are among the most ancient of existing types of animal structure, their range in space having been as extensive as their range in time. The brachiopods propagate by eggs, and, according to some, also by gemmation.—The last acephalous order is the *lamellibranchiata*, characterized by a right and left shell, enclosing a depressed body, covered on both sides by a layer of the mantle; the branchia are at the sides of the body, mostly lamellar (whence their name) and placed under each lobe of the mantle, but sometimes pectinated; they are generally two on each side, and sometimes the triangular interval between them on the dorsal surface is used as a temporary deposit for the eggs. Most have 4 lamelliform tentacles, in pairs on the sides of the mouth; the shells are opened by an elastic ligament at the back, and are closed by one or two internal muscles, in the former case being called *monomyaria*, and in the second *dimyaria*. The heart is arterial, consisting of a ventricle and usually of 2 auricles, the former being generally traversed by the end of the intestine. They inhabit both salt and fresh water, and usually live with the back uppermost, resting on the ventral edge of the shell; the sexes are in most cases distinct, and may often be recognized by the shape of the shell; some are hermaphrodite, and the young are sometimes considerably different from the adults; they are ovoviviparous. As a rule there are 3 central nerve masses, each consisting of 2 lateral ganglia, of which the first 2 are always distinct from each other. The valves of the shell are in most of the same shape and size, but in some of the fixed species the lower is the deeper; in the oyster the lower and larger is the left valve; in some the valves close tightly, in others they are open at one or both ends for the passage of the foot and other organs. Along a part or the whole of the margin of the mantle are conical cirri or organs of touch, and also tactile gill-like laminae around the mouth; and this class is frequently sensible of light. Some of this class, like the brachiopods, are fixed; others have a firm and muscular prolongation from the abdomen, called the "foot," possessing great contractility, by means of which they move about at the bottom of the water; at the base of the foot in some species is a bundle of thread-like filaments, called the *byssus*, secreted by a glandular tissue, and occasionally united into a common mass; a familiar example of this is seen in the common mussel (*mytilus borealis*, De Lam.), which attaches itself by its silken threads very firmly to rocks, shells, and sea weeds; a few, unprovided with a byssus, grow fast by one of

the shells to submarine objects. Many of this class are entirely fossil, and of some genera the extinct species are more numerous than those now living, the latter being in this case usually found in the Indian and S. Pacific oceans. Among the monomyarians may be mentioned the common oyster and the comb or scallop shell (*pecten*); among the dimyrians, the pearl oyster (*meleagrina*), hammer shell (*malleus*), wing shell (*pinna*), mussel (*mytilus*), ark shell (*arca*), fresh water clam and mussel (*unio* and *anodonta*), cockle (*cardium*), the great clam or *benitier* (used in Roman Catholic churches to contain holy water, sometimes 2 feet wide, genus *tridacna*, the largest of the class), the horse-foot clam (the beautiful *hippopus*), the edible quahog (*venus mercenaria*), the shell from which the wampum of the American Indians was made, the small fresh water *cyclas*, the common clam (*mya arenaria*), the razor shell (*solen*), the *pholas* (piddock or stone-borer), the ship worm (*teredo*), so destructive to timber in vessels and dockyards, the waterpot shells (*aspergillum*), and the club shells (*clavagella*). All bivalves are very prolific; in those which, like the oyster, are fixed, the sperm cells of the male are carried by the currents of the water to the cavity of the mantle of the female, as the pollen of the male tree is wafted by the air to the stigma of a distant female tree.—The remaining three fourths of mollusks are called *encephala*, from having a distinct head, commonly with eyes and tentacles, and a mouth with a complex masticatory apparatus; they have been divided into the class of *cephalophora* (head bearers) and *cephalopoda* (with the head surrounded by the feet). The *cephalophora* have been subdivided, according to the modifications of the locomotive organs, into the orders of *pteropoda*, *heteropoda*, and *gasteropoda*. The *pteropoda* are so called from 2 wing-like muscular expansions from the sides of the anterior part of the body, used as swimming organs, and not, according to Owen, homologous with the foot of gasteropods; they are small, marine, floating, hermaphrodite, and oviparous; the form is very variable, some being globular, others long and slender; the heart, as in the whole class, is arterial, that is, receiving veins from the respiratory organs and giving off arteries to the body; the urinary sac, within the mantle and near the heart, communicates with the respiratory cavity and with the pericardial sinus, introducing water into the blood; some are naked, others are provided with very delicate shells of various forms; the eyes are not well developed, but the acoustic sac exists in all; the naked species have 4 tentacles, the testaceous ones only two. In the order *thecosomata*, the head is indistinct, and the shell fragile; the best known genera are *hyalea* and *cleodora*, found in the warmer temperate and tropical seas; some of them are beautiful objects, as they swim through the water like butterflies in the air; one of the largest and finest is the *H. tridentata*, $\frac{1}{4}$ of an inch long, commonly known

as the "chariot of Venus." In the order *gymnosomata*, or naked pteropoda, the head is distinct, and the fins are attached to the sides of the neck; it includes the genera *elio* and *pneumodermion*; of the former, the *O. borealis* exists in such immense numbers in high northern latitudes, that it forms a chief portion of the food of the Greenland whale, and is hence called "whale bait" by the fishermen; it is hardly an inch long.—The order *heteropoda* is characterized by a compressed fin-like foot having a suctorial disk; the branchiæ are fringed or pinnate; the sexes are distinct. All are marine, and usually are rapid swimmers with the back downward and the foot upward; the foot corresponds to the anterior portion of this organ in gasteropoda. They are sometimes called nucleobranchiata, and may be divided into the families *atlantida* and *firolida*. In the first family belongs the *atlanta*, with a delicate shell large enough to protect the body, found in great numbers in the midst of the tropical and temperate oceans; in these the foot supports the operculum. In the second family is placed *carinaria*, sometimes called "the glassy sailor," which has an elongated body, with a very small keeled shell at the posterior part, the apex turned backward; on the head are 2 long tentacles, and 2 sessile eyes behind their base; the middle part of the foot is reduced to a compressed fin-shaped lobe, with a small suctorial disk, by which they adhere to sea weeds, &c.; the motions are rapid and graceful, and they inhabit the temperate and tropical waters; a small species is found in the Mediterranean; the shell of the *O. vitrea*, from the Indian ocean, is highly prized. In the genus *firola* or *ptero-trachea* there is no shell, and the animal is almost transparent; there are 2 eyes, and generally no tentacles, but a slight fleshy proboscis; they swim or float free in mid ocean in great numbers, and also in the Mediterranean.—In *gasteropoda* there is a large muscular disk for creeping developed from the ventral surface of the body (hence the name), and the locomotion of such an instrument of progression is well illustrated in the common slugs and snails. They are usually unsymmetrical, the visceral portion of the body coiled spirally and protected by a univalve shell, the organs of respiration being generally atrophied; the shell is almost always closed by a calcareous, horny, or albuminous operculum. Most are marine, some inhabit fresh water, and a few are terrestrial; they have been divided into orders according to the characters of the breathing apparatus. In some (*monacia*) the male and female organs are in the same individual, in others (*diacia*) the sexes are distinct; most are oviparous, but a few (certain snails) are ovoviviparous. In the water breathers the young are excluded with an operculated shell, which in the naked species is either shed or concealed by the mantle, and by means of ciliated fins on the sides of the head they move far away from their inactive parents, undergoing several metamorphoses in the pro-

cess of growth; the air breathers pass through no such changes. They have the power of repairing injuries and of reproducing lost parts to a considerable degree. Among the monocious gasteropoda are the following 5 orders: I. *Apneusta*, having no distinct respiratory organs, but in their place an extensive aquiferous system, and no shell in the adult; the body is soft and elongated, the integument ciliated; they are marine; *calliopa* and *actæon* are well known genera. II. *Nudibranchiata*, with the branchiæ extending more or less freely from various parts of the body, as in *glauous*, *doris* (sea lemons), in which the branchiæ form a plume-like circle in the middle of the back, and *colis* (sea slugs), in which they are papillose and arranged along the sides of the back. III. *Inferobranchiata*, like *phyllidia*, in which the branchiæ are at the lower part of the sides of the body. IV. *Tectibranchiata*, in which the leaf-like branchiæ are covered by the mantle and a small shell; as in *aplysia* (sea hares), formerly objects of dread on account of their strange form and the violet fluid they eject when molested, in *umbrella*, and in *bulla* (bubble shell). V. *Pulmonata*, in which a part of the mantle cavity forms a vascular air sac or lung; most are terrestrial, and such as live in the water rise to the surface to breathe; a few are naked, but most are shell-bearing, without or with an operculum; in the inoperculated, with a well developed shell, are *helix* (snails), *succinea* (amber snail), *vitrina*, *bulimus*, *pupa*, *achatina*, and other land snails, the slugs (*limax*), land soles (*arion*), pond snails (*limnea*), &c.; in the operculated are *cyclostoma*, *helicina*, *asciula*, &c. In the dioecious gasteropoda belong the following 4 orders: I. *Tububranchiata*, in which the branchiæ are 2, symmetrical, behind the heart, and enclosed with the other soft parts in a long shelly tube; as in *dentalium* (tooth shells). II. *Cyclobranchiata*, in which the branchiæ are a series of lamellæ, surrounding the body between the foot and mantle; as the limpets (*patella*), used as food and for bait, and the sea wood-lice (*chiton*), with multivalve shell pieces like the carapace of articulates. III. *Dentibranchiata*, in which the branchiæ are plumose or pectinate, and with the body protected by a widely opened inoperculate shell; as in the ear shells (*haliotis*); the delicate violet shells (*janthina*), found abundantly in mid ocean, feeding upon the aculeophan *velutella*, and suspended by a raft of air vesicles, to the under surface of which the egg capsules are attached; and the *fenestrella*, or key-hole limpets. IV. *Pectinibranchiata*, in which the 2 comb-like branchiæ are contained in a dorsal cavity of the mantle opening widely above the head; they have 2 feelers and 2 eyes, and a proboscis capable of elongation in a tube form; the females secrete an albuminous matter in which the eggs are enveloped, a familiar example being the yellow grape-like bunches of the whelk (*uccinum*); here belong the bonnet limpet (*calyptraea*) and the slipper shell (*crepidula*); the top shells (*turbo*) and the phe-

sant shells (*phasianella*); the river snails (*paludina*), the periwinkles (*litorina*), the turret shells (*turritella*), the wentletraps (*scalaria*), the *cerithium*, and *natica*; cowries (*cypraea*), very handsome shells, and one species, *C. moneta*, used as money on the W. coast of Africa; *marginella*, *voluta*, *mitra* (mitre shells); the tuns (*dolium*), harps (*harpa*), whelks (*buccinum*); rock shells (*murex*), fig shells (*ficula*), wing shells (*strombus*), the seraphs (*torebellum*), and numerous others.—The class of *cephalopoda*, the highest type of mollusks, is characterized by the locomotive and prehensile organs being attached to the head, whence they radiate in the form of muscular arms and tentacles, and by an internal skeleton combined in some with an external shell, though the integument in most is uncalcified and flexible; the head is free and the body is covered by a muscular sac or mantle, with a transverse anterior aperture from which projects the expiratory siphon or tube; the branchiæ are concealed, the sexes distinct, and the animals oviparous, aquatic, marine, predatory and carnivorous, nocturnal, and social; the colors are changeable and brilliant; they emit an inky secretion when disturbed, which permits them to escape by the discoloration of the water; this is what the true India ink is made from, and is so indestructible that it has been found well preserved in belemnites and other fossil species; some are luminous. This class have a rudimentary internal skeleton; in the head of most is a cartilaginous ring around the œsophagus, the upper part covering the cerebral ganglion, and containing the organs of vision and hearing; there is often an additional cartilage to which the muscles of the arms are attached, and others on the back and sides. The mouth is in the middle between the arms, and has 2 jaws like the bill of a parrot, the lower the larger; the head is separated from the body by a constriction like a neck; there is a well marked tongue. The sexual organs are at the base of the visceral sac, and the spermatophores are very active; in some of the octopods, one of the arms is deciduous, and becomes a male organ, described by Ouvier as *hectocotylus* and a parasite; the eggs are laid in heaps, attached to each other and to foreign bodies. The nervous system is largely developed. For purposes of respiration water is drawn in and expelled by the muscular action of the mantle and funnel, as the gills have no vibratile cilia; the water enters the branchial cavity at the anterior opening of the mantle, and is forced out through the funnel, in this way propelling the animals backward. In the first order, the *tetrabranchiata*, the branchiæ are in 2 pairs, without branchial hearts, and the mantle is thin and not very muscular; the ink bag is absent; the arms are very numerous, hollow, and with retractile tentacles; eyes pedunculate; the head retractile within a many-chambered siphunculated shell. In the present creation this order contains only the genus *nautilus* (see NAUTILUS); in past ages lived the

ammonites, baculites, hamites, orthoceratites, turritiles, &c. In the second order, the *dibranchiata*, the branchiæ are 2, each with a branchial heart; the funnel is an entire tube, and the mantle is muscular; an ink bag is present; there are 8 non-retractile arms, large and complicated, bearing sucking disks or *acetabula*, with in most 2 additional long arms; the eyes are sessile and in orbits; the shell is internal, except in the female argonauts. In the decapod tribe, with 8 arms and 2 tentacles, belong the genus *spirula*; the extinct belemnites; the cuttle fishes (*sepia*), whose internal bone is well known to all keepers of canary birds, and whose clusters of corneous pediculated eggs are called "sea grapes" by the fishermen; the flying squids (*ommatrephes*), so called from their leaping out of the water and sometimes falling on the deck of vessels, and which form a principal part of the food of the carnivorous cetaceans, the albatrosses, and the large sea birds; the hook squids (*onychoteuthis*), which have the ends of the long tentacles provided with a double series of incurved hooks, and the allied genus *enoplo-tenthis*, which has been known to measure 6 feet to the end of these tentacles, and is justly feared by the Polynesian divers for pearls; the common squid or calamary (*loligo*), familiar to all residents by the sea, and which makes at certain seasons an excellent bait for codfish; *Rossia*, named in honor of Sir J. C. Ross, from the arctic seas, in which a fold of integument is reflected over the eyes, evidently to protect these organs from floating ice. In the octopod or 8-armed tribe, there are no tentacles, the arms have sessile suckers, and the branchial chamber is divided by a longitudinal partition; the arms are more robust, and are often united by a web at the base, constituting a powerful swimming organ. Among the naked octopods belong the so called sea spiders (*octopus*), with an ungainly purse-shaped body, long arms provided with suckers, and large eyes; they were known to the ancients under the name of *polypi*, and were and are still used as food; they are solitary, powerful, and voracious, seizing living prey with their arms and tearing it with their horny jaws; they are regularly exposed for sale in the markets of Smyrna and Naples, but are difficult to obtain on account of the tenacity with which they adhere to rocks and the facility of their escape in the water which they discolor; they creep on the bottom by means of the arms, with the eyes upward and the rounded end of the body downward, like huge spiders; when at rest they coil the arms together under the body, the eyes also upward, and in this position resemble immense frogs; in some of the tropical seas they attain an enormous size, having been seen so large as to be able to explore by the extent of the arms a circumference of 12 feet, almost realizing the stories of the fabled kraken. *Eledons* and *tremoctopus* are allied genera. The genus *argonauta* or paper nautilus is well known for the delicate and beautiful shell of the female, which the

poets have made to sail upon imaginary waters, propelled by 2 arms expanded to catch the breeze, and by the others used as oars; the scientific accuracy of this opinion will be discussed and fuller details given under NAUTILUS, though strictly speaking the argonaut belongs to a different order of cephalopoda. The shell is used only for protecting and hatching the eggs; the male has no shell, and impregnation is effected by a deciduous *hectocotylus*.—The local distribution of faunæ and the distinctness of zoological regions are well illustrated by mollusks; while some are very limited in their range, others, like the *cypræa*, are extensively spread even across ocean barriers; some are cosmopolite, wandering wherever their food is found; *helix cellaria*, attaching itself to water casks, occurs in most seaports of the world, *H. similis* wherever the coffee plant grows, and *H. vitrinoides* follows the taro or *arum esculentum*. Local collections have an aspect peculiar to the region, and certain forms are eminently characteristic; analogous species are found in coördinate regions, more marked on the isothermal lines of longitude than of latitude; in the latter case we have analogous genera, but in the former not only the same genera, but closely allied if not identical species. As a general rule, according to Mr. Jeffreys ("Annals and Magazine of Natural History," 8d series, vols. ii. and v., 1858-'60), specimens are larger toward the north than toward the south; colors are usually the brightest in the tropical seas, except in specimens from great depths. (For details on distribution, see "Mollusca and Shells of the U. S. Exploring Expedition," 1838-'42, by A. A. Gould, M.D., Boston, 1852.) The distribution of mollusks in time is also very interesting, extending as they do from the lower silurian to the present epoch, and affording precious materials for the geologist and palæontologist; all the classes are represented in the earliest fossiliferous strata; some families, like the ammonites and belemnites, have passed away; others, like the nautilus, are verging toward extinction; some, like the *lingula*, have continued with slight specific modifications from the silurian to the present day. On the whole, it may be said with Prof. Owen, that as far as we can see "through the dark vistas of geological time, we discern an ascent and progress in the main; lamelli-branchiate have superseded palliobranchiate bivalves; siphonate have succeeded asiphonate univalves; and the dibranchiate now vastly outnumber the tetrabranchiate cephalopoda." Whole strata of the earth's crust are made up principally of the shells of mollusks.—Mollusks are useful to man in many ways; they supply an abundant, wholesome, and usually easily digestible article of food to nations civilized and savage; as for instance, oysters, clams, mussels, snails, and some cephalopoda, bivalves being considered the best, as having the least muscular fibre. In the arts, the ornamental purposes to which the pearl and cameo shells are put

are well known; from the cuttle fish is obtained sepia and India ink; from the *purpura* and *buccinum* of the Mediterranean came the famous Tyrian dye of antiquity; from the filaments of the byssus of *pinna* are made tissues much esteemed on the shores of the Mediterranean. On the other hand, mollusks are sometimes injurious to man; slugs and snails do mischief in gardens; the *teredo* pierces ship timber, and the *pholas* bores into and weakens stone dikes. Not only man but aquatic mammals, birds, reptiles, fishes, and many invertebrates find an ample supply of food in mollusks; and indeed they could hardly escape extinction, were it not for their great fecundity and the inaccessible places in which most of them dwell. The number of species of mollusks probably exceeds 25,000, surpassed only by the number of articulates. The collection of Mr. Hugh Cuming, of London, now (1860) contains about 20,000 species, and nearly 100,000 specimens, obtained from every part of the globe, and is altogether the finest in the world, not only in extent, but in perfection of the specimens; the collection is freely opened to students in this department.

MOLOCH, the national god of the Ammonites, who was worshipped by human sacrifices. The Hebrews seem to have been often addicted to his worship. Solomon, induced by his foreign wives, built a high-place to him; Manasseh imitated this impiety; and the idolatry continued from that time chiefly in the valley of Tophet and Hinnom, till the place was defiled by Josiah. Some of the rabbis explain the terms, which are generally thought to refer to the burning of children as sacrifices to this divinity, to mean only the passage between two fires, or the act of leaping over a fire, as a symbol of purification. Moloch is sometimes identified with the Phœnician Baal.

MOLOCH, an Australian iguanian reptile, of the family *agamida*. The *M. horridus* (Gray) is the most ferocious-looking of any of the lizard tribe, and as ugly as any of the representations of fabled basilisks and dragons. The whole surface of the body is covered with irregular plates and strong sharp spines, and the upper surface of the head is crowned with two very large spines; on the back of the neck are large rounded protuberances, similarly armed with granular scales and spines. With all its spiny armature, it is an inoffensive creature.

MOLOSSIA, or MOLOSSÆ, in ancient geography, a division of Epirus in N. Greece, extending across the province from N. to S. between Athamania on the E. and Thesprotia on the W. In early times it was peopled by various tribes of unknown race, with whom the Molossi, a Grecian people, who claimed descent from the Pyrrhus (Neoptolemus) of Homer, mingled in a later period. Though regarded as half barbarians, the Molossi became predominant in Epirus, and succeeded in establishing a royal dynasty over the whole country in the last quarter of the 4th century B. C., the capital being Ambracia (now Arta), on the gulf called after it.

MOLTKE, ADAM WILHELM VON, count, a Danish statesman, born Aug. 25, 1785. His family came originally from Mecklenburg. He was minister of finance under Christian VIII., and after the revolution of 1848 he became head of the administration, as well as finance minister. In November he became minister of foreign affairs, and continued at the same time his functions as premier until Jan. 27, 1852, when he withdrew from public life. He is known as using his great wealth for the promotion of science and art.—Another member of the same family, Count **ADAM GOTTLÖB DETLEV** (born 1765, died 1848), was devoted to the principles of the French revolution to such an extent, that he relinquished his title of count and signed himself Citoyen Moltke. His younger brother, Count **MAGNUS**, born Aug. 20, 1788, was a member and for some time president of the Schleswig provincial diet, where he became noted for his liberal political principles, which are further attested by his work "On the Nobility and on its Relations to the Bourgeoisie" (Hamburg, 1830), by the description of his travels in upper and central Italy (1881), and by other writings.—Count **KARL**, the eldest son of Count Adam, born Nov. 15, 1800, officiated as minister in Schleswig in 1852, was known for his sympathies with Russia and the absolutist party in Denmark, and died in 1858.

MOLUCCAS, or SPICE ISLANDS, a group of the great Indian or Asiatic archipelago, between lat. 2° N. and 9° S., and long. 122° and 131° E., and scattered over the sea which extends from the E. coast of Celebes to the W. coast of New Guinea; pop. about 600,000. The number of the islands is estimated at several hundreds; many of them, however, are small and uninhabited. The group is formed of 8 clusters, viz., the Gilolos or Moluccas proper, the Ceram, and the Timor Laut. The first of these comprehends the islands of Gilolo, Morty, Mandioly, Batchain, Ooly, Mysole, Ternate, Tidor, and many others of smaller size. The Ceram cluster, which lies in the centre of the group, contains, among others, the islands of Ceram, Booroo, Amboyna, and Banda. The third cluster lies further to the S. between Australia and the W. of New Guinea, and includes the Timor Laut, the Key, and Aroo islands. The outline of the coast of the Molucca islands is very irregular; in many places they rise abruptly from the water to a considerable elevation. There are many excellent harbors, but sand banks are frequently formed by earthquakes which render navigation intricate and dangerous. Nearly all the islands are mountainous, and some of them contain peaks which rise to a height of 7,000 or 8,000 feet. The formation of the group is volcanic; the surface is broken and indented in a singular manner, with enormous peaks and rocks piled up to immense elevations; there are several active craters and hot springs, and violent earthquakes are frequent. On account of the comparatively small size of the islands and the regular monsoons, the heat is never exces-

sive. Cereals cannot be cultivated to any great extent, and as a substitute for bread the people subsist almost entirely upon the pith of the sago palm. The most common tropical fruits and vegetables thrive well, and sugar cane, coffee, pepper, cotton, and small quantities of indigo are grown; but the Moluccas are especially remarkable for the production of cloves and nutmegs. The breadfruit tree, the cacao, and all the fruit trees of India are found. There are over 400 different kinds of wood in the forests, including the *lingoa* (*pretocarpus draco*), which is admirably adapted to cabinet work. No metals are found on the Molucca islands. The group has few indigenous animals, but most of the domestic kinds have been introduced. The surrounding seas are exceedingly prolific, and the cachalot, which yields the spermaceti of commerce, is abundant and attracts many whale ships to the neighborhood. Pearls are frequently found on the coasts. Cloves and nutmegs are exported in large quantities; sandal and other valuable woods are obtained; edible birds' nests, sea slugs, and shark fins are sent to China. The imports are chiefly opium and some Indian and European goods. The Dutch monopolies confined the commerce for many years within very narrow limits, but a more liberal policy has lately been adopted, and trade is said to be improving.—The Moluccas, like nearly all the islands which constitute the Indian archipelago, are inhabited by two races, the Malays and the Papuan or oriental negroes. The latter people, supposed to be of the same family as the aborigines of Australia and New Guinea, have in many of the smaller islands been exterminated by the Malays, and in the larger ones have only retained possession of the interior and more inaccessible parts. The Malays of the group are very much mixed with Chinese and people of Arabian descent. They are in possession of the lower lands and sea coasts, where they cultivate the ground or gain a subsistence by fishing. In disposition they are wild and ferocious. They are very expert in the construction and management of their vessels. The Malay is the common language, and the Arabic character is employed in writing it. Mohammedanism, mixed with some Hindoo rites, is the prevailing religion; but some profess Christianity, and distinguish themselves by wearing black garments. The laws are chiefly founded upon the precepts inculcated in the Koran.—Like other portions of the Indian archipelago, the Moluccas had been visited by the Arabs, and the Mohammedan religion spread among the people long before the arrival of the Portuguese in 1510, by way of the cape of Good Hope, and of the Spaniards by way of Cape Horn shortly afterward. The Portuguese had only begun to form settlements when the Spanish vessels, under Magalhaens, arrived from the east, and a prolonged dispute arose between the two nations respecting the possession of the islands, which terminated in favor of the Portuguese. A system of violence and oppres-

sion was maintained for 60 years, when the Dutch with the assistance of the natives expelled the Portuguese. The Dutch East India company, formed in 1603, had obtained in 1618 the supremacy over many of the native princes, and allowed them to retain their authority by paying tribute to the company. In order to secure to themselves the exclusive trade in nutmegs and cloves, the Dutch formed numerous small settlements throughout the group, by which means they kept the petty sovereigns in subjection, and with their assistance were enabled to extirpate the spice trees on all the islands except Amboyna and Banda, which two they reduced entirely under their authority. With the view of keeping up prices in foreign markets, the Dutch frequently burned whole cargoes of spices. The English were allowed at one time to have a mercantile establishment at Amboyna, when held by the Dutch; but the latter in 1623, after forcing some Chinese and Javanese soldiers by torture to make confession of a plot on the part of the English, seized on the leaders and put them to death with circumstances of the most horrible cruelty. In 1796 the British took possession of the Moluccas, and kept them until the peace of Amiens (1802), when they were restored to the Dutch. The British again took possession of them in 1810, and again gave them up to Holland by the treaty of Paris in 1814. In 1824 some of the more oppressive laws were repealed, and the free cultivation of the islands allowed. The seat of the Dutch governor-general is at Amboyna.

MOLYBDENUM, a white brittle metal, extremely difficult of fusion, first separated from its peroxide, molybdic acid (MoO_3) by Hjelm in 1782; symbol, Mo; equivalent, 46; specific gravity, 8.615 to 8.636. Scheele in 1778 first distinguished its ore, the bisulphuret, from graphite, with which it had been previously confounded, and obtained from it molybdic acid. This may be done by roasting the sulphuret. The product is reduced to the metallic state by exposing a mixture of it with oil and charcoal in a brasqued crucible to intense heat. It may also be reduced when exposed at high temperature in a porcelain tube to a current of hydrogen. In the pulverulent state it soon absorbs oxygen and loses its metallic character, and masses of the metal when heated undergo the same change. Molybdic acid is found in nature combined with lead in the yellow ore, molybdate of lead.—Sulphuret of molybdenum, MoS_2 , is a bluish lead-gray mineral, of hardness 1 to 1.5, specific gravity 4.55 to 4.65, consisting of sulphur 40 and molybdenum 60 per cent. It occurs in small laminated masses, or in small regular hexagonal tables, which cleave in planes parallel to the base of the crystal. It marks paper like graphite; upon porcelain its traces appear greenish. It occurs in granitic and other crystalline rocks, and, disseminated in small quantities, is not rare. It is obtained to small extent for chemical purposes, and for preparing a blue dye, and is worth about \$3 per lb.

MOLYNEUX, WILLIAM, an Irish mathematician, born in Dublin, April 17, 1656, died there, Oct. 11, 1698. After graduating at Trinity college, he went to London, and entered the Middle Temple as a law student. He afterward on returning to Ireland applied himself to the study of mathematics. In 1683 he aided in forming the Dublin philosophical society, whose president he ultimately became. In 1685 the English government commissioned him to inspect the fortresses in Flanders. In 1688 the severities of Tyroconnel's administration compelled him to seek refuge in England; but after the revolution he repaired again to Ireland, and was chosen a member of the Irish parliament for Dublin. Among his correspondents were Newton, Locke, and other eminent men. His principal work is a treatise on optics (*Dioptrica Nova*, 4to., London, 1692 and 1709).

MOMBACHO, a principal volcano of Nicaragua, on the S. shore of Lake Nicaragua, a few miles from the city of Granada. It has an elevation of 4,600 feet, a broad base, and a wide and ragged crater, within which is a lake of water. The lake at its base is studded with conical, volcanic islets, many hundreds in number. The country around it bears marked traces of violent volcanic action of ancient date.

MOMBAS, MOMBAZ, or MOMBASAH, a town on a small island of the same name, in a bay on the coast of Zanzibar, lat. $4^{\circ} 4' \text{ S.}$, long. $89^{\circ} 88' \text{ E.}$; pop. 4,000. The island is about 3 m. long and 2 m. wide; and the coasts consist of steep cliffs which render the town almost impregnable, while it is further defended by an old Portuguese fort. The town is in a ruinous condition, and is inhabited by Arabs and people of mixed race. The bay in which the island is situated is about 5 m. long and 3 broad, and forms the harbor of Mombas, said to be unsurpassed. There is very little trade, and the people are exceedingly poor. The Portuguese destroyed the native town in 1505, and again in 1529; from which time they held the place till they were driven out by the imam of Muscat in 1720. In his turn he was expelled by the natives, who hoisted the English flag, and from 1824 to 1826 the town was under the protection of the British; but they refusing to retain it, the flag was struck, when Mombas fell again into the hands of Sultan Seid Said, who received material assistance in its recovery from an American adventurer with a heavily armed ship. The London church missionary society established a mission at Mombas in 1844, chiefly with the view of having a convenient station as a centre from which to spread the gospel among the tribes of E. Africa.

MOMMSEN, THEODOR, a German historian, philologist, and jurist, born in Garden, Schleswig, Nov. 30, 1817. He studied at the gymnasium of Altona and the university of Kiel. His proficiency in classical philology, and particularly in that branch of it which the Germans call *Epigraphie*, and which has for its object the investigation of inscriptions on public mon-

uments and of other records of antiquity, gained him pecuniary assistance from the Berlin academy in his explorations in France and Italy, (1844-'7). In 1848 he was attached to the staff of the *Schlenwig-Holstein'sche Zeitung*, a political journal. His participation in the movements of 1848-'9 caused him to be removed in 1850 from the chair of jurisprudence at the university of Leipsic, which he had filled for some two years. From 1852 to 1854 he was professor at Zürich, and from that time till the present (1860) at Breslau. His lectures on Roman law have given him a high rank among jurists, while his researches in classical archæology and philology have placed him by the side of Böckh, K. O. Müller, and other distinguished German scholars in that department. His *Oskische Studien* (Berlin, 1845; supplement, 1846), *Die Unteritalienischen Dialekte* (Leipsic, 1850), and *Corpus Inscriptionum Neapolitanarum* (1851), have opened a new era in the study of the philology and archæology of S. Italy, particularly the last work, which contains one of the largest and most remarkable collection of Roman inscriptions extant. He has prepared a similar collection of the ancient inscriptions in Switzerland (Zürich, 1854). Among his other works relating to Rome, that on Roman currency (*Ueber das Römische Münzwesen*, Leipsic, 1850) is held in high esteem, as is that on the municipal institutions of Salpensa and Malaga (*Die Stadtrechte der Lateinischen Gemeinden Salpensa und Malaga*, Leipsic, 1855). His "History of Rome" is still in progress; the first two volumes appeared in 1854, and a second edition at Berlin in 1857. The 3d volume appeared in 1857.—His brother JOHANNES TYCHO, born in 1819, has published an admirable metrical translation of Pindar (Leipsic, 1846), and scholarly essays on that poet (1845) and on Shakespeare (1855).

MOMOTOMBO, the loftiest volcano in the republic of Nicaragua, 7,200 feet high, standing at the head of Lake Managua, 25 m. N. E. from the city of Leon. It is still what the Spaniards call *vivo*, or alive; that is to say, it sends out constantly a light plume of smoke, and occasional showers of fine ashes. The superior 8,000 feet of its elevation seems to be made up of ashes and scorïæ. It has never been ascended, and tradition reports that the early priests who undertook to plant the cross on its summits were never afterward heard of. This tradition has been made the subject of a poem in *La légende des siècles*, by Victor Hugo. There are various hot springs at the base of the volcano, and a number of orifices or vents (*infernillos*) on its flanks. It is a prominent landmark from the sea, and constitutes one extremity of the volcanic range of the Marabios, which terminates in the high cone of El Viejo.

MOMUS, in Greek mythology, the god of mockery and censure, said to have been a son of Nox. Having been chosen by Neptune, Minerva, and Vulcan to decide on the merits of their respective works, he censured them all, in

consequence of which he was expelled from heaven. He is generally represented raising a mask from his face, and holding a small image in his hand.

MONACHISM (Gr. *μονος*, alone), a term denoting solitary life or retirement from the ordinary concerns of the world, with a view to the more or less entire occupation of the soul with religious objects. Monachism had been long in existence when Christianity made its appearance, but its greatest prosperity and development took place in the Christian church, and it is to Christian monachism that this article will be exclusively devoted. It is generally agreed that the germs of it can be traced to the earliest period of the church. Some Protestant historians have been of opinion that monachism was originally foreign to primitive Christianity, and that it was transplanted from non-Christian religions into Christian soil; but others oppose this view, and regard monachism as a natural and almost necessary phase in the progress of Christianity. In the 2d century we find some ascetics, who lived in celibacy and voluntary poverty and shunned intercourse with the world; but they remained isolated. Montanism was characterized as a denomination by some of those peculiar features which later, without interrupting the communion of faith, formed the boundary line between the monk and the people living in the world, both clergy and laity. At the end of the 3d and the beginning of the 4th century monachism received, through Paul of Thebes, Pachomius, Anthony, and other saints, a definite shape, and at once spread throughout the eastern church with amazing rapidity. From its beginning it divided itself into two great branches, the anchorites, who regarded a complete isolation from their fellow men as the best means for a closer union of the soul with the Deity, and the cenobites, who preferred to organize themselves into ascetic congregations, and to aim at exhibiting to the world, in the convent, the model of a sanctified community. Anthony was the father of the former, Pachomius of the latter class. The second form soon prevailed, though the hermit has not altogether disappeared up to the present day. After the first settlements of Pachomius on the island of Tabenna (840), of Macarius in the Egyptian desert, of Hilarion near Gaza, of Ammonius in the Nitrian desert, and of Eustathius of Sebaste in Armenia, the whole East, Asia Minor, Palestine, and Syria, soon abounded with convents. The number of monks after the middle of the 4th century increased to many thousands. A part of their time was devoted to mechanical trades, among which we find ship building, and to agriculture; but all their occupations and rules were designed to overcome the desires of the body, and to make it a willing servant and instrument of the soul in its religious aspirations. Annihilation of individualism was aimed at, in order to be wholly possessed and owned by God. Celibacy was to guard man against attachment to his

fellow men, poverty against attachment to earthly possessions, unconditional obedience to superiors against attachment to himself. The new phenomenon soon secured the entire confidence of the church. The greatest teachers of the church, as Gregory Nazianzen, Basil the Great, and Chrysostom, were its enthusiastic admirers and promoters. From the desert, monastic institutions were soon transplanted to the towns, where in agitated times they came to be regarded as safe places of refuge from the troubles of the world. The writers of the church soon had to lament that many fled to the convent only for the purpose of finding there an easy and comfortable life; that the mask of piety served frequently for concealing laziness and wickedness; that excessive and ill-directed asceticism led many to despair, suicide, licentiousness, and insanity; that gross ignorance and wild fanaticism made the monks the most dangerous tools in the hands of ambitious men, and that their zeal could be turned to acts of violence against Chrysostom as well as to the destruction of pagan temples or the suppression of Arianism. The emperor Valens and several of his successors sought, but in vain, to arrest the too rapid increase of monachism. The contemplative life led many astray into gross anthropomorphism, which caused their exclusion from the church. But though many censured the abuses of monachism, but few were found, like Jovinian, to assail the principle. The abandonment of the monastic state was regarded as a weakness, but in the earlier centuries was not forbidden, although the seceder had to take upon himself a public penance. Beside the more numerous cenobites, anchorites continued to exist, and often received recruits from the convents. They practised all sorts of self-torment, and tried to excel each other in rigor. The stylites, who were found until the 12th century, were the most celebrated among them. Under the growing influence of the Byzantine emperors, the eastern church, and with it eastern monachism, lost all vitality and became petrified. No attempts were made to revive its declining vigor by creating new organizations; traditionally all the eastern monks have followed up to the present day the so called rule of St. Basil, and have called themselves after either St. Basil or St. Anthony. They remain numerous in all the eastern churches, and some of their establishments, as the convents of Mount Athos, are still celebrated for their literary treasures or political influence; but they have ceased altogether to be powerful agencies of religious influence.—The West became acquainted with monachism through Athanasius the Great, who in 340, during his second exile, came to Rome in the company of some Egyptian monks. He soon prevailed on some men and women to embrace the monastic life, which was later particularly recommended by Ambrose, Jerome, and Augustine, and, in consequence of such patronage, soon struck deep roots. In Gaul it was introduced, before the close of

the 4th century, by Martin of Tours and Cassian, the latter of whom, by his work "On Monastic Institutions," awakened a desire for a perfection of the monastic constitution, and fixed certain hours for common religious exercise. In the West as well as in the East most of the monks were laymen, and only the abbot was a priest. The convents were dependent on the bishops, but exemption from episcopal jurisdiction began in Africa as early as the 6th century, and in Gaul in the 7th. It soon became customary to ordain monks to the priesthood, and after the close of the 4th century convents were commonly regarded as the nurseries of the clergy. Cassian, and after him Cassiodorus, recommended as a most suitable occupation for the working hours of the monks the copying of the classic authors and teaching, both of which became favorite occupations, the one remaining so until the invention of the art of printing, the other up to the present day.—A new epoch in the history of western monachism begins with Benedict of Nursia, whose rule (529) came gradually into general use, transforming the previously independent communities into a hierarchical religious order. Convents soon received a special importance as missionary schools, particularly in Ireland, whence a number of devoted monks went forth to complete the conversion of Germany and Switzerland. In these, as well as later in the Slavic countries, it was not only by preaching, but still more by the establishment of convents bearing the character of agricultural colonies, that the conversion of those pagan countries was advanced. The form which monachism took met so fully the approbation of the church, that attempts were made to subject all the secular clergy to similar regulations. This movement was inaugurated by Chrodegangus of Metz, who established the canons regular, but, though often renewed, could never be fully carried out. The rule of Benedict became the bond of union for most of the western convents; but the many favors received from church, state, and individuals, facilitated the growth of moral corruption to a much greater degree than in the eastern churches. The consciousness of this evil called forth attempts at reform, and for many centuries the history of monachism presents a continued struggle of reformers with the laxity, indifference, or immorality obtaining in a larger or lesser number of the convents of their times. The first of these reformers was Benedict of Aniane (died 821), whose commentary on the rule of Benedict of Nursia obtained later an equally authoritative character. Benno, who became in 910 abbot of Cluny, laid the foundation of the celebrated congregation of Cluny, a main pillar of the reformatory party, which was exempted by the pope from episcopal jurisdiction, and received the right of choosing an abbot with the dignity and authority of a bishop. Romoald founded the congregation of Camaldoli in 1028, Gualbert that of Vallombrosa in 1036. The Cistercians owed to their leader, St. Bernard, so great a celebrity, that

they were within a short time introduced into nearly all the European countries. The order of Grammont sought to excel all others in ascetical rigor, and that of the Carthusians adhered more faithfully than any other order to its original spirit. Other orders arose for special benevolent or religious purposes. The order of St. Anthony (1095) and the Hospitallers (1078) devoted themselves to the nursing of the sick, the order of Fontévrault (1094) to the correction of lewd women, and the Trinitarians (1198) to the redeeming of Christian prisoners. Even the warlike tendencies of those times sought a union with the monastic spirit by the establishment of several orders of knights, such as the knights of St. John, the templars, the Teutonic knights, the orders of St. Jago, Calatrava, Alcantara, Avia, and St. Maurice. The large increase of the number of orders called forth much opposition, and the council of Lateran in 1215 passed a resolution that no new order should be established. But notwithstanding this prohibition, the same period witnessed the birth of an entirely new class of orders, the mendicants (Franciscans, Dominicans, Carmelites, Augustinians, and several others), who inaugurated a new era in the history of western monachism. The dangers to which the church was exposed on the part of a number of new dissenting ecclesiastical bodies, required a more active and zealous agency, especially among the lower classes, than the older orders and secular clergy could afford. The mendicants tried to supply this want, and thus became more closely identified with and beloved by the people than any of the former orders had been. The rapidity of their success was astonishing, and very considerable privileges were conferred on them by the popes, frequently to the great annoyance of the bishops. They aimed at being the best soldiers of the church militant, and they had therefore a marked influence on subsequent church history. The Franciscans and Dominicans soon took the lead. Both created for themselves a numerous and influential party among the laity by the establishment of tertiarians, who bound themselves to the ascetic and devotional regulations of the order, without assuming its garb or entering the convent. Both secured also a number of chairs at the theological schools, in spite of the opposition of the secular clergy; and the most illustrious representatives of this and the following centuries (Thomas Aquinas, Bonaventura, Albertus Magnus, Alexander of Hales, &c.) were either Dominicans or Franciscans. Several of their members filled the highest ecclesiastical positions, even the papal chair. They raised monachism to the zenith of its power, influence, and prosperity. In the 14th century, though partly checked by the mendicant orders, a general degeneracy of monachism commenced, and the corruption from which hardly a single order kept itself entirely free became so overwhelming, that toward the close of the middle ages the name monk was often used by writers as synonymous with rudeness and ignorance.

Reformatory attempts were made in every century; a number of new orders, as the Jesuates, Briggittines, Servites, Hieronymites, and others, were founded; but their influence was weak in comparison with that of their predecessors, and frequently after an existence of 50 or 100 years they themselves departed from their primitive standard of rigid asceticism. The councils of Basel and Constance devised for a reformation of monasticism some highly important measures, which, however, could be carried out in a few places only. The Beguards or Beguines, who must be regarded as an offshoot of monachism, exhibited a freer and less hierarchical spirit; and their associational principle was further developed by the Brethren of the Free Spirit, who for some time seemed to be preparing the way for an entirely new phase of monachism, and in their reformatory labors came frequently in collision with the highest church authorities.—The reformation of the 16th century constitutes a new turning point in the history of monachism. The best and most influential men in the church cordially joined in the demand for a thorough reformation; they admitted that the crisis had been in part occasioned by the corruption of the clergy, secular as well as monastic, and they urged in particular the imperious necessity of a reformation of the religious orders. The reformers within the orders received therefore more energetic aid from bishops, popes, and councils. The internal history of nearly every order records, at this point of time, strong resolutions in favor of an enforcement of the rigorous primitive rules. In the most numerous and powerful orders, the Franciscans, in particular, the more rigorous party achieved a complete and permanent success over those inclined toward laxity, and several new reformed congregations branched off from them, among which the Capuchins were the most prominent. The council of Trent emphatically declared the usefulness of monastic establishments, and published a number of decrees which regulated their possessions, internal administration, and the election of superiors, provided for annual assemblies, and extended the rights of the bishops with regard to the inspection and superintendence of the convents. Beside the reformation of the old orders, the church showed herself most prolific in producing new ones. The character of the times impressed itself on most of the new societies. The monastic institutions of former days had been, as religious communities, essentially contemplative; the new ones were predominantly operative, the mendicant orders forming, so to speak, a connecting link between the two. Preaching, teaching, visiting the sick and poor, and similar objects formed the chief occupations of the new orders, to which their greatest energy was directed. The best known among the new orders are the Theatines, the Barnabites, the Oratorians, the Lazarists, and especially the Jesuits, and among the female orders the Elizabethines, Ursulines, and sisters of charity. The constitu-

tion of the Jesuits was controlled, more than that of any other order before or after, by the principle of an absolute submission to the church and the pope. The order was to be an instrument in the hands of the church; the individual therefore was advised to become, with regard to the commands of his superior, as destitute of self-will "as a corpse," or "as a cane in the hands of an old man." No order ever carried out its fundamental principle more faithfully, and in all subsequent battles of the Roman Catholic church the Jesuits stood in the front rank. The culture of literature, against which in the middle ages some founders of monastic orders had expressly warned their members, showed itself, after the 16th century, so great a necessity, that it was practically observed by all orders, though but few gave it special attention. Among these few the French Oratorians and the Benedictine congregation of St. Maur hold by universal consent a prominent place among the great literary societies of the world. A more general attention was given by the religious orders to the cause of education, especially to primary instruction. Many congregations, both male and female, were instituted for this sole purpose, especially in France, and a large number of primary schools have ever since been under their direction.—The great losses of territory and membership which the Roman Catholic church suffered in consequence of the reformation, directed the attention of the monastic orders more than before to the foreign missionary cause. Most of the larger orders, especially the mendicants and the Jesuits, engaged in it with great zeal and emulation. The Jesuits took, in addition to the three common monastic vows, a fourth, binding them to go without hesitation as missionaries to any country where it might please the pope to send them. The extent of their missionary operations in Europe, Asia, Africa, and America, excelled any thing the Roman Catholic church had done in this field before. (See *MISSIONS*.) The great majority of the Roman Catholic missions in all pagan countries have ever since been conducted by the members of religious orders.—In the 18th century the productivity of the church, as regards monachism, greatly decreased; only one larger order, the Redemptorists or the congregation of the Most Holy Redeemer, founded by St. Alfonso di Liguori, sprang up during this time. Most of the orders, in the second half of this century, relapsed into either torpor or corruption, and made but a feeble resistance when the rationalistic views which became so prevalent among the educated classes in every European country, Catholic as well as Protestant, declared against them a war of destruction. Joseph II. suppressed as useless all convents of monks not occupied in education, pastoral duties, or the nursing of the sick; and many Catholic writers demanded the entire extirpation of monachism as both an outgrowth and a promoter of fanaticism. The pope yielded to the general pressure and abolished the most

powerful of all orders, the Jesuits. The French revolution soon afterward endangered the existence of monachism in most of the European states, but with the downfall of the Napoleonic rule its prospects began to brighten. Pius VII. in 1814 restored the Jesuits, who rose again to considerable strength and influence, wherever they were not forcibly suppressed. (See *JESUITRY*.) In the countries of the Latin race, both in Europe and America, the fate of monachism was closely allied with the political strife of the conservative and the liberal or progressive parties, the former patronizing it together with all other ecclesiastical institutions, the latter subjecting it to prohibitive rules or suppressing it altogether. In consequence of the successes of the liberals, monachism was greatly reduced in South America, and in Italy (in 1848, and again in 1859 and 1860), and almost entirely suppressed in Portugal (1834) and Spain (1835). In France alone the vicissitudes of political rule in no way affected the rapid growth of monastic institutions, which, in point of zeal, activity, and general prosperity, were not behind what they had been during the golden era of their existence. Under the Bourbons and under Louis Philippe the liberal party occasionally demanded coercive measures against them; but since the establishment of the republic in 1848 even the liberals have given a wider interpretation to religious liberty, and accustomed themselves no longer to refuse the free right of association to the members of religious orders. Nearly every one of the old orders reestablished itself in France, and as a number of new congregations were formed, there is at present a greater variety of monastic institutions in that country than any state has possessed at any previous period. M. Dupin stated, in a speech before the French senate in July, 1860, that there were 4,982 authorized and 2,870 unauthorized establishments. Next to France, they are most numerous, wealthy, and influential in Belgium, where, as in France, public instruction is to a great extent under their control. Among the Germanic nations they partook, throughout the British possessions, North America, and Holland, of the blessing of truly liberal institutions, and peaceably lived in accordance with their rules, from which public opinion demanded only one departure, that no member wishing to leave their establishments should be restrained from doing so. Austria protected them, but kept them until 1848 under a bureaucratic guardianship, which has since been changed into a zealous support and encouragement. The revolution of 1848 procured them freedom in many other German states where before they had been either suppressed or tolerated under great restrictions; and even those states whose codes retain laws against their admission in general, as Sweden, Denmark, and Saxony, admitted the sisters of charity. In Russia they suffered severe losses, but Turkey became a prominent field for their missionary operations.—The number of monastic associa-

tions founded since the beginning of the 19th century is considerable, and exceeds the number founded during any other period of equal length. Most of them belong to France, and several have already attained a considerable extension. A peculiar feature which characterizes them as the offspring of the present age, and distinguishes them from all the preceding orders, is easily discerned in all of them; the marks which externally distinguish them from the non-monastic world are less visible, and the social wants of ecclesiastical and civil society stand preëminently forth as the primary cause of their origin and the chief object of their labors. A large number of them are devoted to the instruction of youth. Such are several congregations of school brothers and school sisters, brothers and sisters of St. Joseph, brothers and daughters of the holy cross, &c. Many others bind themselves to the service of the sick and the poor, as the little sisters of the poor, the most numerous and popular among them. Not a few cultivate the mission field; either the foreign missions, as the Piepus society, the Oblates, the brothers and the daughters of Zion (both for the conversion of Israelites, the latter consisting exclusively of converts); or the home missions, as the Paulists, established in 1858 at New York. In a literary point of view they are at present far from sharing the reputation of their predecessors in former centuries, though men like Lacordaire, Ravignan, and Gratry in France, Rosmini and Secchi in Italy, and Haneberg in Germany, occupy a high place in the annals of contemporaneous literature. In respect to their moral condition, Roman Catholics admit the existence in some places, particularly in Central and South America, of considerable corruption and ignorance in many convents of the older orders. In some of these also the ancient constitutions have fallen more or less into disuse. The regular connection of the general superiors with their subordinates has been in great part interrupted, and the holding of general assemblies has ceased. Pope Pius IX., at the beginning of his pontificate, proclaimed it as one of his chief tasks to carry out a thorough reform of monastic orders; and in some orders, as the Dominicans, an extensive reformation has since taken place. The number of monastic institutions in 1860 was estimated as follows: male orders and congregations 88, with about 7,065 establishments and 100,000 members; female orders and congregations 94, with 9,247 houses and a little more than 100,000 members. —The reformation of the 16th century rejected the monachism of the Roman Catholic and the eastern episcopal churches, as being based on the false principle of the meritoriousness of good works. One small denomination, the Dunkers, has retained nearly the whole of the monastic organization. In the church of England and the Protestant Episcopal church in the United States, sisterhoods have been formed at various times, and have of late increased in number under the auspices of what is common-

ly called the high church party. Solitary voices among the Protestant theologians of the 16th, 17th, and 18th centuries have expressed a regret that, with the monachism of the old churches, the principle of forming religious communities of men and women for the more efficient fulfilment of the duties of charity had been altogether discarded. Since the beginning of the 19th century both the "Evangelical" and the "High Lutheran" schools of Germany have approved the establishment of houses of deacons and deaconesses, also called brother houses and sister houses, the inmates of which associate for the purpose of teaching, of attending the sick, of taking charge of public prisons, and for other works of Christian charity. Institutions of this kind are rapidly spreading in Germany and the adjacent countries. —The most important works on the history of monachism in general are: Hospiniani, *De Monachis libri VI.* (Zürich, 1588, 1609); Helyot, *Histoire des ordres monastiques* (Paris, 1714-'19; new ed., with an additional vol. on the modern history of monachism, by Migne, 4 vols., 1849); and Döring, *Geschichte der Möncheorden* (2 vols., Dresden, 1828). A superior work was expected from Möhler, but he died after having barely commenced it; an interesting fragment is contained in his *Vermischte Schriften*, vol. ii. (Ratisbon, 1839). The most comprehensive work on the subject is Montalembert's *Les moines d'Occident*, the first two volumes of which were published in 1860 at Paris, and republished in English at Edinburgh and in German at Ratisbon. Another extensive work has been for some years in preparation by Dom Gueranger, the superior of the French congregation of Benedictines. The monastic statistics of the several countries may be found in Schem's "Ecclesiastical Year Book" for 1859 (New York, 1860). (See RELIGIOUS ORDERS.)

MONACO, a small principality of Italy, bounded S. by the Mediterranean, and surrounded on all other sides by the province of Nice, between the cities of Nice and Ventimiglia, extending 5 m. along the coast and about 8 m. inland, and consisting of the 3 communes of Monaco, Mentone, and Roccaruna; pop. about 7,000. The principal products are fruit and oil. The Genoese family Grimaldi was in possession of this territory under the protectorate of various governments from the 10th century until the early part of the 18th, when, by the marriage of the sole heiress of the name, it passed into the hands of Jacques de Goyon-Matignon, count of Thoiry. Under his grandson Honoratus IV. it was united with the French republic in 1793, but restored to him in 1814, and ceded to Sardinia in 1815. The latter government acknowledged the independence of the principality, and reserved to itself only the power of garrisoning it and of appointing the military commander of the town of Monaco. Honoratus V. succeeded his father in 1819, and died in 1841. His successor Florestan I. protested in vain in 1848 against the annexation of the communes of Mentone and Roccaruna by Sardinia, and open-

ed negotiations with foreign governments for the sale of his rights. He died in Paris, June 20, 1856, and was succeeded by his son under the name of Charles III., but his government in the principality was terminated by the events of 1859, which placed the whole territory under the control of Sardinia. Monaco, the capital, pop. about 2,000, is said to have become a rival of Nice as a watering place.

MONADNOCK, **GRAND**, a mountain in New Hampshire, near the S. W. corner of the state. The base covers an area of 5 m. by 3, and the altitude, according to Professor Dana in 1816, is 3,450 feet above the level of the sea. Several minerals are found on and around the mountain, and it contains talc, mica, and slate, distinctly stratified. It is visible from the dome of the state house at Boston, and is a conspicuous landmark for mariners approaching the coast. Seen from a distance, its summit appears of a rounded form, free from rocks and mural precipices. Many streams of water issue from Grand Monadnock, and from its top may be seen no fewer than 80 collections of fresh water, some of them large enough to contain islands of 8 or 10 acres.

MONAGHAN, an inland county of Ireland, province of Ulster, surrounded by Tyrone, Armagh, Louth, Meath, Cavan, and Fermanagh; area, 500 sq. m.; pop. in 1851, 141,758. The surface is in general hilly, except in the S. E., which is level, and forms the northern limit of the great central plain of Ireland. The principal mountains are the Slieve Beagh range, whose highest summit is 1,254 feet above the sea. The chief rivers are the Blackwater, Fane, Glyde, and Finn. There are several lakes, the largest being Muckno, or Barrac Lough, which is about 3 m. long and 1 m. broad. The soil is moory and peaty in the elevated districts, but fertile in the central and southern. The staple manufactures are linen, woollen, and earthenware. The minerals are iron, lead, coal, slate, marble, and building stone. Monaghan is divided into 5 baronies and 21 parishes, and returns 2 members to the imperial parliament. The chief towns are Monaghan, the capital, Clones, Castle Blaney, and Carrickmacross. It is traversed by the Ulster canal and various lines of railway.

MONASTERY, a house for the habitation of monks or nuns. When governed by an abbot or abbess, it is called an abbey; and when ruled by a prior or prioress, a priory. If the superior bears neither of these titles, it is generally known simply as a monastery, convent, or nunnery. The origin of monasteries may be traced to about the 8d century A. D., when the anchorites who inhabited the desert of Egypt began to build their cells adjoining one another, for the greater convenience of receiving the instructions of some hermit who enjoyed a reputation for peculiar sanctity. In the middle ages in Europe the monastery became almost a town in itself. Within it often could be found all the necessities of life, many if not most of

which were the produce of the brethren's labor. Such were the famous convents of St. Gal, Fulda, Cluny, Cîteaux, and Clairvaux; and some of the Trappist monasteries retain much of the same character even to the present day. (See **MONACHISM**.)

MONBODDO, **JAMES BURNET**, lord, a Scottish judge, born at the family seat of Monboddie, in Kincardineshire, in 1714, died in Edinburgh, May 26, 1799. He was graduated at the university of Aberdeen, and was sent to Groningen to study law. In 1788 he returned to Scotland, and practised at the bar till 1767, when he was made a judge. Boswell in his "Tour to the Hebrides" gives an account of a visit paid to him by Dr. Johnson, whom he resembled so much in some respects, that Foote the actor called him an Elzevir edition of Johnson. He was noted for his hospitality, and the guests at his learned suppers, as they were called, comprised the most eminent men of Edinburgh. He expressed an extravagant predilection for the language, literature, and philosophy of Greece, but at the same time held that the savage state was the happiest. He maintained that men were originally no better and possessed of no higher faculties than beasts, and that the orang outang is of the human species. His principal works are: "A Dissertation on the Origin and Progress of Language" (6 vols. 8vo., 1774-'92), and "Ancient Metaphysics" (6 vols. 4to., 1778).

MONCALVO. See **CACOTIA**, **GUGLIELMO**.

MONCEAU. See **DUTHAMEL DU MONCEAU**.

MONOREIFF WELLWOOD, **SIR HENRY**, a Scottish divine, born at Blackford, Perthshire, Feb. 6, 1750, died in Edinburgh, June 14, 1827. He was the son of the Rev. Sir William Moncreiff, and assumed the name of Wellwood in the latter part of his life. He was educated at Glasgow and Edinburgh, was ordained in 1771, and succeeded his father as minister in Blackford until 1775, when he was appointed minister of St. Outhbert's, Edinburgh. He early connected himself with the evangelical party in the church, and became in time its leader. The principal of his works are: "Discourses on the Evidence of the Jewish and Christian Revelations" (Edinburgh, 1815); "Account of the Life and Writings of Dr. John Erskine" (1818); and "Sermons" (8 vols. 8vo., 1829-'31), with a memoir by his son.

MONDAY (Lat. *Luna Dies*, Fr. *lundi*, Ger. *Montag*, the day of the moon), the second day of the week, which derives its designation from the Romans, who gave the names of the sun, moon, and 5 planets to the 7 days in modern use.

MONDOVI, an episcopal city of Piedmont, capital of a province of the same name, situated on the right bank of the Ellero, 1,810 feet above the sea, and 53 m. W. from Genoa; pop. 16,000. It is built partly on a hill, is walled, and has a citadel. The streets are adorned with many handsome edifices, among which are the cathedral of San Donato, 4 or 5 churches, and several convents. There are numerous schools and charitable institutions.* The

manufactures are of woollens, silks, &c. The city was founded in the 12th century by the people of the surrounding villages, as a place of refuge during the civil wars. It remained an independent republic until 1396, when it submitted to Amadeus of Savoy, titular prince of Achaia. On April 21, 1796, it was the scene of a battle between the French under Victor and the Sardinians under Colli, in which the latter were defeated with the loss of 2,000 men and 8 guns. In 1799 the city was subjected to acts of fearful violence by the French in punishment for its having risen against them.

MONE, FRANZ JOSEPH, a German historian, born at Mingolsheim, Baden, May 12, 1796. He studied and officiated as professor at the university of Heidelberg for nearly 10 years until 1827, when his work on statistics obtained for him the professorship of that science at Louvain, which he lost however after the Belgian revolution, when he returned to Heidelberg. In 1835 he became director of the Baden archives, and was appointed by the government to prepare a history of Baden, a portion of which has since appeared. His principal works are: *Geschichte des Heidenthums im nördlichen Europa* (2 vols., Heidelberg, 1822-'3), which may be regarded as the supplementary volume to the late Prof. Creuzer's "Symbolics and Mythology of the Ancient Nations;" an edition of *Beinardus Vulpes* (Stuttgart, 1832); *Uebersicht der Niederländischen Volksliteratur älterer Zeit* (Tübingen, 1838); and *Die Gallische Sprache und ihre Brauchbarkeit für die Geschichte* (Carlsruhe, 1851).

MONEY, the medium of exchange used by any people—at the present day, among civilized nations, confined entirely to metallic coins and bank notes. Money being an important instrument of association and combination in society, it is almost impossible to overestimate its power, or to exaggerate the disadvantages which follow from its absence or from a deficiency in its supply. The peculiar characteristic possessed by money, and that quality which gives to it its importance and influence, is the fact that in society it is the one thing which is acceptable to all men, and in exchange for which they will give any commodity which they possess. Labor being the cause of all wealth, the advance of any nation or community in material prosperity is dependent upon the extent to which labor is husbanded and directed to productive pursuits. The presence of a large supply of money in a country must therefore exert an important influence upon its advancement in prosperity, by furnishing the means wherewith labor can be paid, and thus preventing its waste; for it must be remarked that labor possesses a peculiarity in this, that "it is the only commodity that perishes at the instant of production, and that if not then put to use is lost for ever."—Very numerous and most dissimilar substances have been made to serve the purposes of money among the different people of the world. Of the aboriginal money of the American continent,

from the mounds in and adjoining the valley of the Mississippi, specimens have been found composed of lignite, coal, bone, shell, terra cotta, mica, pearl, carnelian, chalcedony, agate, jasper, native gold, silver, copper, lead, and iron, "which were fashioned into forms evincing a skill in art to which the descendants of the aborigines now surviving are strangers." Wampum, as is well known, was used by the Indians as currency, and consisted originally of strings of small spiral fresh water shells. The Carthaginians had a kind of money made of leather, which was probably of the nature of bank notes; and in the 18th century, Niccolo and Mattheo Polo of Venice penetrated from Constantinople, through Asia, to "Cambalu in Cathay," where they found the money then in use was made of the middle bark of the mulberry tree, cut in round pieces, and stamped with the mark of the sovereign. This money it was death to counterfeit, or to refuse in any part of the empire. In Britain, at as late a date as the Norman conquest (1066), two kinds of money were in use, known as "living money" and "dead money." The former consisted of slaves and cattle, which were usually transferred with the soil, and the latter of metal. The earliest recorded account of a purchase and sale is to be found in Gen. xxiii. Sarah, the wife of Abraham, being dead, he bought from Ephron a field in Machpelah for a burial place for her, and he "weighed to Ephron the silver which he had named in the audience," "four hundred shekels of silver, current money with the merchant." It will be observed that this money was not counted, but weighed; the money of that day being pieces of silver cut to certain weights, as shekels, talents, and drachms, but not coined. There is no evidence pointing to the practice of coinage by the Jews until about 144 B. C., under the Maccabees. In addition to the ordinary money, they had in use a description of "jewel money," personal ornaments which in case of necessity could be used as currency. The invention of coinage is ascribed by Herodotus to the Lydians, to whom also by some authors is given the credit of the "invention of merchandise." By other writers the honor of the invention of coinage is given to the people of Ægina, who were among the first Greeks who applied themselves to commerce and navigation. It would appear probable, however, that to the Asiatics is the world indebted for coinage as an art. It is doubtful whether any of the coins hitherto discovered date within some centuries of the original invention, though it is supposed that the Lydian coins actually obtained indicate a higher antiquity than that of any Greek specimens. On these coins the symbols were usually animal emblems, and it was not until after the age of Alexander that the portraits of sovereigns were used. From Greece the system of coinage penetrated into Gaul, and from the colony of Massilia, now Marseilles, extended to Britain, where coins somewhat similar to those issued by Philip and Alexander of Macedon took in part the place

of the Celtic ring money. Asia Minor possessing native gold in abundance, its earliest coinage was of that metal; while, copper being found in Italy and Sicily, the money first used in these countries was of bronze. In the reign of Servius Tullius, king of Rome, 578-534 B. C., the pound weight of copper was first made current money; and from the fact that these coins bore upon them the images of cattle (*pecus*), they received the name of *pecunia*. It was not until 281 B. C. that the Romans issued silver coins, nor gold coins until 207 B. C. At the date of the invasion of Britain by Cæsar (55 B. C.), the ancient Britons had "both lozenge and gold money, or, instead of money, rings adjusted to a certain weight." They had also coins of tin, as well as of brass and iron. The brass of which the coins were made was imported, while the tin and iron were the product of their own mines smelted by themselves. It is related that under the emperor Claudius the coinage of the Romans took the place of that of the natives, and there circulated until the abandonment of the country by the conquerors, early in the 5th century A. D. About the close of the 2d century the Romans began to purchase peace from their enemies with money. Tribute money of this kind was paid by Lupus, the governor of the northern portion of Roman Britain, to the Caledonians. In the year 214 this was again done by the emperor Caracalla, who in consideration thereof was permitted by the chief of the nations of Germany to retire from that country. About this time Caracalla created a fictitious or base currency made of gilt copper, and of lead plated with silver, which was given to his poor subjects. It is recorded that about the middle of the 6th century the kings of the Franks were "permitted" by the emperor Justinian to coin money from Gallic gold, and to imprint it with their own portraits. The earliest coins of England, known to have been issued after the withdrawal of the Romans, are supposed to be the pennies of Ethelbert, king of Kent (560-616). By King Athelstan (980) it was decreed that throughout his entire dominions money should be uniform and be coined only in towns. The following places were indicated, with the number of coiners to each: Canterbury, Rochester, London, Winchester, Lewes, Hastings, Othchester, Southampton, Wareham, Exeter, and Shaftesbury. At all towns not named in this list there was to be but one coiner. This decree also makes mention of the fact that the clergy of superior rank shared with the king the privilege of coinage. Again, in the year 975, King Edgar decreed that the coinage should be uniform, from which it would seem that Athelstan's decree had not been fully complied with. During the reign of Canute (1016-35) no fewer than 87 cities and towns were points at which the coinage of money took place, as is shown by specimens actually collected. In Saxon England the pound currency consisted of an actual pound of silver; and while it is well settled that the pound was coined into 240 pennies, authorities differ wide-

ly as to the number of shillings in the pound. Some have it 48 shillings of 5 pennies each, some 60, and some but 20. The date of the earliest use of the term "sterling" to denote the standard money of England has given rise to much discussion, and it has been pretty clearly determined as having been adopted in the reign of William the Conqueror, although some authorities fix it as late as Richard I. or John. Henry I. in 1108 attached severe penalties to the counterfeiting of money, and many of the pennies and halfpennies being bent and broken, he decreed that no one should refuse to receive them if they were entire. Prior to this time the halfpenny had been semicircular, being one half part of a penny; but Henry now ordered that halfpennies should in future be regularly coined. During the reign of Stephen the money had become very much debased, as well by the frauds of the legally constituted coiners, as from the fact that "almost every baron had usurped the prerogative of issuing money by his own authority." It does not seem that up to this time the right of bishops and abbots to coin money had been disturbed by any of the monarchs of England. At the commencement of his reign (1154) Henry II. found the money so much debased and reduced in value from various causes, that he provided for a new coinage, and punished all those convicted of tampering with it. In 1207 the places of coinage were still very numerous. In 1222 dies were given to the officers for the coinage of pennies, halfpennies, and farthings of silver. In 1248 it was found that the money of England had been so clipped and otherwise defaced that its real worth bore no proportion to its nominal value. Henry III. hereupon decided that the old coins should be brought to the mint and exchanged for new ones, weight for weight, which was the cause of such severe loss to the holders as to induce great complaint. In the reign of the same monarch, 9 years later, gold coins were made of the purest metal, and the standard was fixed at 20 times that of silver. To this the opposition was so great that the king decreed that all holders of it might have it exchanged for silver at his royal exchange on submitting to a deduction of 2½ per cent. Prior to this time gold had never been rated so high in comparison with silver. It may here be mentioned that by some writers it has been thought that no gold was coined in England earlier than the reign of Edward III. (1327-'77), but this is an error. In 1279 Edward I. gave orders for a new coinage of halfpennies and farthings, providing at the same time that the old, which was principally of mere fractions of pennies out of sizes to suit, should no longer be current. Holders of the old coin were however allowed to exchange it at the mints for new, by paying a certain percentage as "change" or "exchange," as it was termed. During the same reign, 20 years later, so much trouble, annoyance, and loss were suffered from foreign coins of inferior value, known as "pollards," "crockards," &c., that it was en-

acted that all importers of such money should be punished by death and the confiscation of their property. All persons arriving from abroad were to be searched, and those having such money were to be immediately imprisoned. All good foreign money was to be taken forth-with on its arrival to the exchange, and all false English money imported was to be seized. No person was allowed to sell wool, hides, skins, lead, or tin, except for good sterling money, silver stamped at the king's exchange, or for a good and sufficient quantity of merchandise; and no money or bullion was to be taken out of the dominions without a license from the king, under penalty of seizure. Persons going abroad, or coming to England, were to be furnished at Dover with a quantity of money of the country to which they were going, sufficient to pay their expenses. The following year (1800) Edward positively prohibited the circulation of any money not of his own coinage. In 1801 he diminished the weight of the pound sterling 3 pennies, equal to one per cent. This was "a departure from the ancient strict and honorable adherence to the integrity of the national money; and a breach, once begun, was with less scruple enlarged by the succeeding kings." Edward II., having married a daughter of the king of France, gave permission to the French merchants to trade with England, and return with their goods and money, notwithstanding the edicts of preceding monarchs against the exportation of coin and bullion. In the reign of Edward III. (1335), among the extraordinary means which were taken to prevent the importation of money of foreign coinage from abroad, may be mentioned that of obliging innkeepers to be sworn to search their guests for the detection of such money. Exchanges were established at Dover, London, Yarmouth, Boston, Kingston, and Hull, for furnishing to travellers going abroad foreign money. This monarch, having by 1344 exhausted his exchequer, and embarrassed himself with debts, in his unsuccessful attempts to conquer France, ordered that in future 266 pennies should be made from the pound sterling, thus defrauding his creditors of 10 per cent. of their claims. Two years subsequently he increased the number to 270 pennies. In 1394 it was decreed that no silver money should be melted for the manufacture of plate or for any similar purpose. Counterfeiting of English money would seem to have been a very common practice in those days; and in 1416 parliament passed an act declaring it treason to counterfeit the money of the kingdom, and providing for the punishment by the judges of importers of base coin. Five years later the currency was in so bad a state that a law was passed by parliament providing that all gold money should be passed only by weight, and that all light and vitiated coins should be taken to the tower to be recoined; in consideration of the loss sustained by the holders, the king remitted the usual charge for coinage. In the reign of Henry VII. (1504) a

law was passed against either taking English money into Ireland, or bringing Irish money into England. The following year a trifling number of shilling pieces were coined, being the earliest known to have been made. Under Henry VIII. enactments against the exportation of money, plate, and jewels were again passed; and in this reign (1528) silver farthings were coined for the last time. In the reign of Edward VI. (1551) the currency reached its worst condition of depreciation, and was "in such a state of confusion and fluctuation, that the sellers scarcely ever knew what value they were to receive for their goods," when the king applied active and vigorous measures for correcting the evil by raising the standard. Queen Elizabeth signaled the beginning of her reign by restoring the silver coin to a higher standard of purity than had been known since the accession of Henry VIII. In 1601 she caused to be coined for Ireland shillings, sixpences, and threepences of a baser kind, and established offices for exchange between the two countries. For many years the tradesmen of London had made and issued leaden tokens, which circulated instead of copper coins. This circulation was, however, to a great extent stopped about the beginning of the 17th century by the government; and the more general use of regular coins gradually took their place. James I. in 1618 debased a portion of the coin, having for some unaccountable and unexplained reason coins in circulation of two qualities of fineness. In 1627 Charles I. issued a proclamation, saying in effect that the buying, selling, and exchanging of all manner of coins and bullion were prerogatives of the crown, which from that time forth he intended to exercise; he interdicted the goldsmiths from prosecuting the business in any of its branches, and appointed Lord Holland and his deputies to have "the office of our changes, exchanges, and outchanges whatsoever in England, Wales, and Ireland." In 1632 he granted permission to the East India company to export to Persia and India £40,000 in foreign gold bullion; and being desirous of cultivating friendly relations with Philip IV. of Spain, he authorized under certain restrictions the export of the precious metals to the Spanish Netherlands. According to D'Avenant, the entire gold and silver coinage of England for 100 years, from 1558 to 1659, was: of gold £3,728,000, and of silver £16,109,476, making in all £19,832,476. By the same authority it is estimated that in the year 1600 the total amount of gold and silver currency in England did not exceed £4,000,000, and that in 1711 it did not exceed £12,000,000. In 1676, Charles II. being then on the throne, the money coined during the commonwealth and protectorate was called in and recoined. This amounted to £800,000; and by estimating that coinage at one seventh, and giving an allowance for money hoarded, writers of that day put the total currency of the country at £6,000,000. One of the most memorable events in the monetary

history of England, or of the world, was the establishment of the bank of England, April 25, 1694, William and Mary being then the sovereigns of England. (See *BANK*, vol. ii. p. 578.) This institution is indebted for its existence to the wants of the government, which had been obliged to pay interest at rates varying from 20 to 40 per cent. per annum. It at once relieved the government from embarrassments, and became the principal means of the success in the campaign of 1695, thus aiding materially and decidedly in bringing about the peace of Ryswick in 1697. The following table, derived from the "indentures" made with the masters of the mint, will exhibit the number of pounds, shillings, and pence which have at various times in England been coined out of a pound of silver, with the standard of fineness:

| Date. | Fine Silver. | Alloy. | £ | s | d. |
|------------------------------|--------------|--------|---|----|----|
| Before A. D. 1800..... | 11 2 | 0 15 | 1 | 0 | 0 |
| 1800, 25 Edward I..... | 11 2 | 0 15 | 1 | 0 | 0 |
| 1844, 18 Edward III..... | 11 2 | 0 15 | 1 | 2 | 2 |
| 1846, 20 "..... | 11 2 | 0 15 | 1 | 2 | 6 |
| 1853, 27 "..... | 11 2 | 0 15 | 1 | 5 | 0 |
| 1412, 18 Henry IV..... | 11 2 | 0 15 | 1 | 10 | 0 |
| 1444, 4 Edward IV..... | 11 2 | 0 15 | 1 | 17 | 6 |
| 1597, 18 Henry VIII..... | 11 2 | 0 15 | 2 | 5 | 0 |
| 1543, 24 "..... | 10 0 | 2 0 | 2 | 8 | 0 |
| 1545, 26 "..... | 6 0 | 6 0 | 2 | 8 | 0 |
| 1546, 27 "..... | 4 0 | 8 0 | 2 | 8 | 0 |
| 1549, 3 Edward VI..... | 6 0 | 6 0 | 3 | 12 | 0 |
| 1551, 5 "..... | 3 0 | 9 0 | 3 | 12 | 0 |
| 1551, and { 4 Edward VI..... | 11 1 | 0 19 | 3 | 0 | 0 |
| of 1552, 1 Mary..... | 11 0 | 1 0 | 3 | 0 | 0 |
| 1560, 2 Elizabeth..... | 11 2 | 0 18 | 3 | 0 | 0 |
| 1601, 43 "..... | 11 2 | 0 15 | 3 | 2 | 0 |

At the present day the standard of fineness is the same, but the weight of the coins has been reduced, the shilling weighing but 87 grains, and a pound of silver thus producing 66 $\frac{1}{8}$ shillings.—The currency of Scotland prior to the time of Robert I. (1806) was of the same standard as that of England at the same date, 11 oz. 2 dwt. of fine silver, and 18 dwt. of alloy, making one pound; but that standard was reduced gradually, until in 1424 it represented £1 17s. 6d. From this time forth it was rapidly reduced, standing in the under mentioned years as follows: 1451, £3 4s.; 1456, £4 16s.; 1475, £7 4s. In 1529, 11 oz. of fine silver and 1 oz. of alloy represented £9 12s.; in 1556, £13; and in 1565, £18. In 1571, 9 oz. of fine silver and 8 oz. of alloy were £16 14s.; in 1576, 8 oz. of fine silver and 4 oz. of alloy were £16 14s. In 1579, 11 oz. of fine silver and 1 oz. of alloy were £22; in 1581, £24; in 1597, £30; and in 1601, £36. In 1738, 11 oz. 2 dwt. of fine silver with 18 dwt. of alloy were £37 4s. The earliest coinage of Scotland is believed to have taken place in the reign of Alexander I., 1106–24.—The early history of the money of England, in one respect at least, answers to a considerable extent for a history of the currency of all countries of the same era. Fluctuations, debasement, and feeble efforts to restore it, mark the progress of time. In France, Pepin, the first of the Carlovingian race, in his reign (752–768) increased the number of pennies in a

pound of silver from 240 to 264. This abuse was however corrected in the succeeding reign by Charlemagne. But Philip I. in his reign (1060–1108) caused his *deniers* or pennies to be made of $\frac{1}{2}$ copper and $\frac{1}{2}$ silver. The depreciations of the coin have since then been very great and numerous.—In America, "the several provinces in their infancy," says an English writer in 1767, "had but little trade, and consequently little money. The tools, utensils, and necessaries for planting they were at first supplied with from Britain, involved them in debt before they were able to raise goods for exportation to pay their creditors; and the goods they first raised were often so ordinary in quality or so little in quantity that they were able to export to a foreign market, that the net proceeds of the same often turned out poorly; by which means the planters remained continually in debt to the British merchants, and occasioned the balance of trade to be always against them; and having neither goods nor cash sufficient to remit to their creditors, the consequence has been that many bad debts have been made and great losses sustained, as the merchants of Great Britain have but too fatally experienced." As the northern colonies improved in their condition, the British merchants received their claims in part; but this "prevented the cash staying with them" (the colonists), "and obliged them to ship it off with their other merchandise toward paying their debts." The provinces were now driven to the issue of paper money for circulation at home, and the writer above cited assures us that "gold and silver" were "as much merchandise as any they dealt in." This state of things went on, and with it the rate of exchange advanced rapidly, as will be seen by the following table:

| Years. | Sterling exchange in Mass. currency. | Value of an oz. of silver in currency. |
|-----------|--------------------------------------|--|
| 1703..... | 133 | 6s. 10 $\frac{1}{2}$ d. |
| 1705..... | 135 | 7 0 |
| 1712..... | 150 | 8 0 |
| 1716..... | 175 | 9 8 |
| 1717..... | 225 | 12 0 |
| 1723..... | 370 | 14 0 |
| 1738..... | 240 | 18 0 |
| 1780..... | 380 | 20 0 |
| 1787..... | 500 | 26 0 |
| 1791..... | 550 | 28 0 |
| 1799..... | 1,100 | 60 0 |

The currency of Rhode Island suffered such a depreciation between 1744 and 1759, that while in the former year it required £450 to obtain £100 sterling, in the latter it required £2,800. However, in or about the year 1767, measures were taken to place the currency of some of the colonies on a better footing. What was the nature of the reforms so made we are not informed; but in 1767 the following were the rates of sterling exchange in the provinces named: Massachusetts, 188 $\frac{1}{2}$; New York and East Jersey, 175 to 171 $\frac{1}{2}$; Pennsylvania and West Jersey, 165 to 160 $\frac{1}{2}$; Virginia, 125; Maryland, 145; North Carolina, 145; South Caro-

lina, 700; Georgia, 100; Jamaica, 140; Barbados, 185; Nevis and Montserrat, 175; Antigua and St. Christophers, 165. (For American revolutionary and national currency and coinage, see BANK, and COINS; and for further information, see MINT, and NUMISMATICS.)

MONGE, GASPARD, a French mathematician, born in Beaune in 1746, died July 28, 1818. In 1766 he was a tutor in the school of engineers in Mézières, and was afterward assistant to Bossut, and also to the abbé Nollet, whom he succeeded in the chair of natural philosophy. While in this school he made numerous experiments in physics and chemistry, and investigations into the principles of geometry, which led to the foundation of a new and important department of that science, to which he gave the name of descriptive geometry. In 1780 he was made a member of the academy of sciences, and soon after professor of physics in the lyceum of Paris. During the revolution he was for a short time minister of marine; and when materials for equipping the army were to be suddenly provided, and almost created, he devoted himself with great energy to the work. It was through his exertions that the normal and polytechnic schools were established, the one to supply teachers, and the other to furnish engineers; he taught in both schools. He accompanied the army into Italy and Egypt, where he formed a lasting friendship with Bonaparte, and on his return was made president of the Egyptian commission, head of the polytechnic school, and member of the senate with the title of count of Pelusium; but on the fall of Napoleon he was deprived of all his honors and emoluments. He was the first who applied the differential calculus to the general theory of surfaces. His best known work is the *Géométrie descriptive* (4th ed., 1820), which has never been surpassed as an elementary text book.

MONGOLIA, a country of Asia, and at present a part of the Chinese empire, lying between lat. 35° and 52° N. and long. 82° and 128° E., bounded N. by the Russian government of Irkutsk in Siberia, N. E. and E. by Manchuria, S. by the Chinese provinces of Chi-li and Shan-si and the Yellow river, S. W. by Kansu, and W. by Cobdo and Ili; area, 1,400,000 sq. m.; pop. 2,000,000. It is chiefly a high plain, 3,000 feet above the sea, almost destitute of wood and water. In the central part is the great sandy desert of Gobi, which stretches from N. E. to S. W. with an area estimated at 600,000 sq. m. The chief mountain ranges of Mongolia are the Altai and its various subordinate chains, which extend eastward under the names of Tangnui, Khangai, and Kenteh, as far as the Amoor; and the Ala-shan and In-shan ranges, which commence in lat. 42° N. and long. 107° E., and run N. E. and N. to the Amoor in lat. 58° N. The rivers of Mongolia are chiefly in the north. The Selenga, Orkhon, and Toola unite their streams and flow into Lake Baikal. The Kerlon and Onon rise near each other on opposite sides of the Kenteh range, and

flow in a N. E. direction to the Amoor. In the south, the Siramuren and its branches unite in the Liau river. Lakes are numerous, and some of them are large. South of the desert of Gobi are the Oling and Dzaring, and the Koko-nor or Blue sea, which according to the Chinese accounts is 190 m. in length and 60 in breadth. In the N. W. part of the country lakes abound, the largest of which are the Ursa-nor, Altai-nor, Alak-nor, and the Iki-aral.—Mongolia is divided into 4 principal regions: 1, Inner Mongolia, lying between the great wall and the desert of Gobi; 2, Outer Mongolia, between the desert and the Altai mountains, and reaching from the Inner Hingan to the Tien-shan; 3, the country about Koko-nor; 4, Uliasntai and its dependencies. Inner Mongolia is divided into 6 corps and 24 tribes, which are again divided into 49 standards, each comprising about 2,000 families commanded by hereditary princes. The Korchin and the Ortous are the principal tribes. Another large tribe, the Tsakhara, occupy the region immediately north of the great wall. Outer Mongolia is divided into 4 circles, each of which is governed by a khan or prince who claims descent from Genghis Khan. The Khalkas are the principal tribe, and their 4 khanates are divided into 86 standards, each of which is restricted to a particular territory from which it is not allowed to wander. The country about Lake Koko-nor is occupied by Tourgouths, Hoshots, Khalkas, and other tribes, arranged under 29 standards. Uliasntai is a town of 2,000 houses in the W. part of Mongolia, and lies in a well cultivated valley on the river Iro. Its dependent territories comprise 11 tribes of Khalkas divided into 81 standards.—Mongolia is supposed to be rich in metals and minerals, but little is accurately known of its natural history. Its immense plains and gloomy forests are inhabited by multitudes of wild animals, among which are the elk, the stag, the wild goat, the wild ass, the yak, the brown and black bear, the ounce, and two species of tiger, beside hares, squirrels, and foxes. The wolves of Mongolia are large and fierce, and prefer to attack men rather than animals; they will pass through a flock of sheep to attack the shepherd. The Mongols wage against them incessant and vindictive war. The announcement that a wolf has made its appearance in a neighborhood is a signal for every man to mount his horse. The horsemen run it down, capture it with a lasso, drag it to the tents, and after torturing it for some time akin the animal alive and turn it loose in that condition. Among the birds of Mongolia are pheasants and eagles. The eagle is very common, and makes its nest where it pleases, the people abstaining from molesting it in any way. The double-humped or Bactrian camel exists in both the wild and domesticated state. This camel endures the most intense cold, not only without injury but apparently with pleasure. It delights to face the north wind in winter, or to stand motionless in places exposed to the severest blasts. Its milk is excellent, and

supplies large quantities of butter and cheese. The flesh is not esteemed by the Mongols, who generally eat only the hump.—The soil of Mongolia is poor, and little of it is fit for cultivation on account of the want of moisture, neither rain nor snow falling in sufficient quantities except on the acclivities of the mountain ranges. From the great elevation of the country and the dryness of the atmosphere, the climate is excessively cold. Mercury often remains frozen for weeks in succession. The winter lasts 9 months, and is immediately succeeded by summer, in which there are sometimes days of stifling heat. The nights, however, are almost invariably cool. At all seasons the weather is subject to great and sudden changes. In the southern part of the country, where the Chinese emigrants have introduced agriculture, it is noticed that the temperature has risen with the increase of cultivation, so that kinds of grain which formerly would not ripen because of the cold are now raised with success. In this part of Mongolia there are towns and villages, and a portion of the native race have adopted a settled life.—The Mongols belong to the great Mongolian division of mankind, which takes its name from them. They belong also to the great nomadic family of central Asia, who in Europe are commonly known under the vague general designation of Tartars. They are generally stout, squat, swarthy, and ugly, with high and broad shoulders, pointed and prominent chins, long teeth distant from each other, eyes black, elliptical, and unsteady, thick, short necks, bony and nervous hands, and short muscular arms. Their stature is equal to that of Europeans. They are, with few exceptions, nomadic in their mode of life, living in tents and subsisting on animal food, the produce of their flocks and herds. The Mongol tent for about 8 feet from the ground is cylindrical in form; it then becomes conical like a pointed hat. Its woodwork is composed below of a trellis-work of crossed bars which fold up and expand at pleasure. Above these, a circle of poles, fixed in the trellis-work, meets at the top, like the sticks of an umbrella. Over the woodwork is stretched a thick covering of coarse felt. The door is low and narrow, and is crossed at the bottom by a beam which serves as a threshold. At the top of the tent is an opening to let out smoke, which can at any time be closed by a piece of felt hanging above it, to which is attached a long string for the purpose. The interior is divided into two compartments, that on the left being for the man, while that on the right is occupied by the women, and is also used as a kitchen, the utensils of which consist chiefly of large earthen vessels for holding water, wooden pails for milk, and a large bell-shaped iron kettle. A small sofa or couch, a small square press or chest of drawers, the top of which serves as an altar for an idol, and a number of goats' horns fixed in the woodwork of the tent, on which hang various utensils, arms, and other articles, complete the furniture of this primitive habitation.

The odor pervading the interior of the Mongol tent is, to those not accustomed to it, disgusting and almost insupportable. "This smell," says M. Hue, "so potent sometimes that it seems to make one's heart rise to one's throat, is occasioned by the mutton grease and butter with which every thing on or about a Tartar is impregnated. It is on account of this habitual filth that they are called *Tao-Ta-Dae*, 'stinking Tartars,' by the Chinese, themselves not altogether inodorous, or by any means particular about cleanliness." Household and family cares among the Mongols are assigned entirely to the women, who milk the cows, make butter and cheese, draw water, gather fuel, tan skins, and make cloth and clothes. The occupation of the men consists wholly in conducting the flocks and herds to pasture, which, as they are accustomed from infancy to horseback, is an amusement rather than a labor. They sometimes hunt wild animals for food or for their skins, but never for pleasure. When not on horseback the men pass their time in absolute idleness, sleeping all night and squatting all day in their tents, drinking tea or smoking. Their education is very limited. The only persons who learn to read are the lamas or priests, who are also the painters, sculptors, architects, and physicians of the nation. The training of the men who are not intended for priests is confined to the use of the bow and the matchlock, and a thorough mastery of horsemanship. M. Hue says: "When a mere infant the Mongol is weaned, and as soon as he is strong enough he is stuck upon a horse's back behind a man, the animal is put to a gallop, and the juvenile rider, in order not to fall off, has to cling with both hands to his teacher's jacket. The Tartars thus become accustomed from a very early age to the movement of the horse, and by degrees and the force of habit they identify themselves as it were with the animal. There is perhaps no spectacle more exciting than that of Mongol riders in chase of a wild horse. They are armed with a long heavy pole, at the end of which is a running knot. They gallop, they fly after the horse they are pursuing, down rugged ravines and up precipitous hills, in and out, twisting and turning in their rapid course, until they come up with their game. They then take the bridle of their own horse in their teeth, seize with both hands their heavy pole, and bending forward throw, by a powerful effort, the running knot around the wild horse's neck. In this exercise the greatest vigor must be combined with the greatest dexterity in order to enable them to stop short the powerful untamed animals with which they have to deal. It sometimes happens that cord and pole are broken; but as to a horseman being thrown, it is an occurrence we never saw or heard of. The Mongol is so accustomed to horseback that he is altogether like a fish out of water when he sets foot on the ground. His step is heavy and awkward, and his bowed legs, his chest bent

forward, his constant looking about him, all indicate a person who spends the greater portion of his time on the back of a horse or a camel." The Mongols marry very young, and their marriages are regulated entirely by their parents, who make the contract without consulting the young people at all. No dowry is given with the bride, but on the contrary the bridegroom's family pay a considerable price for the maiden. A plurality of wives is permitted, but the first wife is always the mistress of the household. Divorce is very frequent, and is effected without the intervention of either the civil or the ecclesiastical authorities. The husband who wishes to repudiate his wife sends her back to her parents, without any formality except a message that he does not require her any longer. This proceeding does not give offence, as the family of the lady retain the cattle, horses, and other property given to them at the time of the marriage, and have an opportunity of selling her over again to a fresh purchaser. The women, however, are not oppressed, and are not kept in seclusion. They come and go at pleasure, ride out on horseback, and visit freely from tent to tent. In their manners and appearance they are, like the men, haughty, independent, and vigorous. The chiefs of the Mongol tribes and all their blood relations form an aristocracy who hold the common people in a mild species of patriarchal servitude. There is no distinction of manners nor of mode of living between these classes; and though the common people are not allowed to own land, they frequently accumulate considerable property in herds and flocks. Those who become lamas are entirely free.—The ancient religion of the Mongols was a species of Shamanism, but in the 13th century they embraced Lamaism. Their religious system at the present day is similar to that of Thibet, and they acknowledge the spiritual supremacy of the grand lama at Lassa. They are very devout, and are generous and even prodigal in their contributions for religious purposes. Mongolia abounds in well endowed lamaseries constructed of brick and stone, with elegance and solidity, and ornamented with paintings, sculptures, and carvings. The most famous of these monasteries is that of the Great Kouren, on the bank of the river Toola, in the country of the Khalkas. Thirty thousand lamas dwell in this lamastery, and the plain adjoining it is always covered with the tents of the pilgrims who resort thither from all parts of Tartary. In these lamaseries a strict monastic discipline is maintained, but ~~each~~ ^{the} lama is at liberty to acquire property by practising as a physician, by casting horoscopes, or by working as a sculptor or painter, or in any occupation not inconsistent with his priestly character. Almost all younger sons of the free Mongols are devoted from infancy to the priesthood, and this tendency to monasticism is encouraged by the Chinese government in order to keep down the growth of population among the Mongols. Almost every lamastery of the first class possesses a living Bud-

dha, who like the grand lama of Thibet is worshipped as an incarnation of the deity. The influence of these personages is very great, and the Chinese emperors, who are constantly in dread of the Mongols, watch the living Buddhas with anxious care, and spare no pains to conciliate them and to win over to their interest those who manage these deities.—The trade between China and Russia passes through Mongolia at Kiakhta, a town on the borders of the two countries. This trade, which is entirely under the supervision of Mantchoo officers, introduces among the Mongols European goods in moderate quantities.—The Mongolian is the least known of all the languages of Asia. It was reduced to writing about the 14th century, and its literature consists in great part of translations of Chinese books. It embraces, however, a few original histories and many poems, relating chiefly to Genghis Khan and to Tamerlane. It is with Genghis Khan that the history of the Mongols properly commences. This greatest of conquerors was born about 1160 and died in 1227. At his birth the Mongols were divided into petty and discordant tribes. He united them into one nation, inflamed them with religious and warlike enthusiasm, and led them forth to conquer the world. Under his banners they subjugated the whole of Tartary, a great part of China, Corea, Afghanistan, Persia, and Russia. Under his son and successor, Ogulatai, the conquest of China was continued, the caliphate of Bagdad was overthrown, the sultan of Iconium in Asia Minor made tributary, and Europe overrun and devastated as far as the Oder and the Danube. The Mongol empire was at this time the most extensive that the world has ever seen. In 1260 Kublai Khan, the grandson of Genghis, completed the conquest of China. He is known in Chinese history as the emperor She-tsu, and as the founder of the 24th or Yuen dynasty. He was a vigorous and magnificent ruler, and the grand canal of China, which was dug during his reign, is a lasting monument of his enlightened policy. The Venetian Marco Polo was among the foreigners who were liberally entertained and employed at his court. Under him and his descendants the Mongols were masters of China for upward of a century, till in 1368 the native race rose in insurrection and established their independence under the Ming dynasty. The Mongol empire was split into several independent sovereignties in the 13th century, but was reunited and even enlarged by Tamerlane (1368–1405), who almost rivalled Genghis Khan as a warrior and a conqueror. After his death the Mongol power slowly declined, and in the early part of the 17th century they gradually submitted to the sovereignty of the Mantchoo emperors of China. They yield, however, little more than a nominal obedience, and are still a haughty and independent race, proud of their descent from Genghis, and fully conscious that their ancestors were once the masters of the world. The Chinese government watches and humors

them with incessant anxiety, and conciliates their chiefs by annual presents of considerable value.

MONGOLIAN RACE, one of the great ethnological divisions of mankind. Its characteristics are: an olive yellow skin; thin, coarse, and straight hair; scanty beard; broad, flattened face, low forehead, wide and small nose; oblique eyes, thick lips, and a stature inferior on the whole to that of the Caucasian race, but superior to the Malay. The head is less compressed at the sides than in the other races, so that it presents, when viewed in front, a more rounded contour. The complexion is always sufficiently light to show a flush, and in the extreme north is sometimes decidedly florid. Prof. Dieterici, an eminent Prussian statistician, in 1859 estimated the number of the Mongolians at 528,000,000; this, however, is probably an overestimate, though they are certainly more numerous than any other race. Dr. Pickering in "The Races of Man" includes the American Indians among the Mongolians. He says: "The arctic regions seem exclusively possessed by the Mongolian race; which beside is diffused through a greater variety of climates than any other, and over a far larger area. This comprises about one half of Asia, and with a slight exception all aboriginal America, or more than two fifths of the land surface of the globe. Notwithstanding the recent encroachments, the greater portion of the American continent is still inhabited by Mongolian tribes; and while some of them wander toward the north further than civilized man has hitherto been able to follow, others are still the nearest dwellers to the southern pole." By most writers, however, the American Indians are held to be a distinct race, and the term Mongolians is restricted chiefly to the following nations: the Mongols proper, the Mantchoos, Coreans, Chinese, Tibetans, Anamites, Burmese, Siamese, Japanese, Samoyeds, Koriaks, Ourala, Ostiaks, Kamtchatdales, Finns, Laplanders, Esquimaux, and the various tribes inhabiting Turkestan or Independent Tartary, who are commonly called Tartars by Europeans, though the term is not used by the people to whom it is applied.

MONGOUS. See *LEMUR*, vol. x. p. 452.

MONTEAU, a central co. of Mo., bounded N. E. by the Missouri river, and drained by Saline, Moreau, and Monteau creeks; area, 400 sq. m.; pop. in 1856, 6,402, of whom 593 were slaves. Iron, limestone, and excellent coal are found; and the soil is generally fertile. The productions in 1850 were 843,914 bushels of Indian corn, 24,540 of wheat, 68,615 of oats, and 21,674 lbs. of wool. There were 3 grist mills, 3 saw mills, 9 churches, and 780 pupils attending public schools. Capital, California.

MONITOR, the common name of many of the old world slender-tongued lizards of the family *varanida*, and genus *varanus* (Merr.). They have an elongated head; long, extensile, bifid, fleshy tongue, enclosed in a sheath at the base; no teeth on the palate, those of the jaws

flattened at the roots, lodged in a common groove or alveolus without internal border, with the crowns generally pointed and curved backward; the neck long; the head and body covered with tuberculated non-imbriated scales; the tail very long, sometimes containing 80 vertebrae, capable of reproduction, non-prehensile, compressed and keeled or rounded according as the species are aquatic or terrestrial; no femoral pores nor dorsal crest; eyes with 2 distinct movable lids; feet large, with 5 unequal, non-palmated toes, furnished with strong claws; in the fore limbs the 1st finger is the shortest, and the 3d and 4th longest; in the posterior the 4th is 3 times as long as the 1st. The monitors form a natural transition to the serpents, in the suspension of the bones of the face to the cranium and their mobility, in the incomplete circle of the orbits, in the long and narrow lower jaw loosely united in the middle, in the tongue, and in the scaly covering. The colors vary from black to more or less deep green, with lighter spots arranged in various ways so as to resemble mosaic work; many of these patterns are so admirable that the skin has been used to cover jewel boxes and cases requiring a material which will not readily tarnish by ordinary friction. These reptiles are, next to the crocodiles, the largest of living saurians; they live either in the neighborhood of rivers, or in dry sandy regions, the former class being said to give notice of the presence of crocodiles by a whistling sound, whence their common name; they do not climb trees nor scale precipices, though they run rapidly on the ground, in a sinuous serpent-like manner on account of the length of the tail. Their food consists principally of the larger coleopterous and orthopterous insects; they also eat the eggs of aquatic birds and reptiles, and such lizards, small tortoises, fish, and mammals as they are able to overpower. If the American genus *heloderma* (Wieg.) be excluded (and this is now generally placed near the lizards proper), the true monitors, of which fewer than 20 species are described, are confined to Asia, Africa, and Australasia. Of the genus *varanus*, erroneously called *tupinambis* by Daudin, the best known aquatic species is the monitor of the Nile (*V. Niloticus*, Fitz.), common in the rivers of Egypt and of western and southern Africa, and attaining a length of 5 or 6 feet, of which the head is about $\frac{1}{4}$, the neck $\frac{1}{3}$, and the tail nearly one half; the teeth are 80 above and 22 below; the general color above is greenish gray with black dots, with 4 or 5 yellow V-shaped marks pointing backward upon the nape, bands of yellow eye-like spots on the back, a wide black band on the shoulder, and a narrow one edged with pale green on each temple; whitish below, with brown transverse bands, and the claws black. From its supposed usefulness in devouring the eggs of the crocodile, it was highly esteemed by the ancient Egyptians, and was frequently represented on their monuments. Other aquatic species are found in the East Indies, and in Australia and

its archipelago. Of the terrestrial monitors the best known is the *V. scincus* (Merr.), the skink of the ancients, the land crocodile of Herodotus, the *ouaran* of the Arabs, and the genus *psammosaurus* of Fitzinger. This is very common in the sandy deserts of Egypt; it is about 8 feet long, of which the rounded tail is more than one half. The color of the upper parts varies from brown to yellow, spotted and banded with one or the other; it is less carnivorous and ferocious than the aquatic monitors. Another species is found in the island of Timor, of a brownish color marked with black and yellow, about 2 feet long.—Ouvier, in his *Ossemens fossiles*, has referred to the family of monitors several gigantic fossil reptiles, as the *protosaurus* (H. de Meyer), 8 feet long, from the coppery schists of Germany; the *mosasaurus* (Conyb.), over 80 feet long, intermediate between the monitors and iguanas, from the calcareous strata of Maestricht; the *gosaurus* (Ouv.), 12 or 18 feet long, from an iron mine near Mannheim; and the *megalosaurus* (Buckland), about 40 feet long, from the vicinity of Oxford, the last placed by Pictet among the dinosaurs, or those having certain mammalian characters.—The name of monitor is sometimes given to some American lacertian lizards, especially of the genus *salvator* (Dum. and Bibr.), more properly called safeguards, corresponding in part to *tupinambis* (Daud.) and *tejus* (Merr.), and to *monitor* (Fitz).

MONK. See MONACHISM.

MONK, GEORGE, duke of Albemarle, an English general, born at Potheridge, Devonshire, Dec. 6, 1608, died in London, Jan. 3, 1670. He was of a good family, and at the age of 17 he entered the military service, and was present in an expedition sent against Spain, and in that to the isle of Ré. For several years he served in the Low Countries, and was made a lieutenant-colonel in the force which Charles I. employed against the Scotch in 1638. On the breaking out of the Irish rebellion in 1641, he was sent to Ireland, with the rank of colonel. His conduct there was so good, that the lords justices would have made him governor of Dublin, but the parliament party had possession of the place, and he was ordered to England by the commander of the royal army. His political opinions were favorable to the parliamentary cause, and when he arrived in England he was deprived of his regiment by the king's order; but he was allowed to go to Oxford, where he won the royal favor, and was made a major-general in an Irish force, then employed in England. This force was defeated by Fairfax, and Monk made prisoner. After being confined for some time in the tower of London, he accepted service in the parliamentary army, and returned to Ireland in 1646, in company with the deputy, Lord Lisle. The king was so strong there that they effected nothing, and returned to England. Again going to Ireland, with command of the army in the north, he was distinguished for his energy and cruelty. A treaty which he made with the Irish in 1649

was condemned by parliament, and he was unemployed for some time thereafter. Cromwell, when he commenced the war with Scotland in 1650, made Monk colonel of a foot regiment, and lieutenant-general of the artillery. He performed important services, and was appointed to the chief command in Scotland in 1651. He completed the conquest of that country, which he governed with considerable skill, and was a commissioner to bring about the union of England and Scotland that existed in the days of the protectorate, and acquitted himself well in the office. He served in the navy against the Dutch, and had his share in the victories that were won. At first he was opposed to Cromwell's usurpation, but an interview with the protector changed his opinions; and he was again sent to Scotland, where he quelled a rebellion. For a time he governed that country alone; and when a council of state was there established, he controlled its action. His rule was arbitrary, but not severe, and the Scotch prospered under it. The royalists early had hopes that a restoration could be effected through his aid, and Charles II. wrote a letter to him, which he sent to Cromwell. While Cromwell lived, Monk knew it was impossible to act for the Stuarts, and he devoted himself to the immediate duties of his station with substantial success. The protector is represented to have been jealous of him, but on his death-bed he recommended him to his son and successor. Monk gave good advice to Richard Cromwell, and showed every disposition to support his government, proclaiming him in Scotland. When Richard failed, and matters were falling into confusion in England, Monk marched with his army to London, where he declared for a new parliament, the government having virtually passed into his hands. He might have become lord protector, but his ambition was not of a lofty order. For months after he left Scotland it was uncertain what his purpose was; but at length, in the spring of 1660, he took measures for the restoration of the house of Stuart. Charles II. returned to England, and Monk was lavishly rewarded with offices, titles, and estates. He was made Baron Monk, earl of Torrington, and duke of Albemarle; the order of the garter was bestowed upon him, and he received the offices of privy councillor, master of the horse, and commander of the forces. Later he was made lord lieutenant of the counties of Middlesex and Devonshire, and of the borough of Southwark. In 1664 he was placed at the head of the admiralty, and in 1667 at the head of the treasury. His income was £19,000, an enormous one for those days, and exceeded by that of only two other subjects, the duke of Buckingham and the duke of Ormond. In 1666 he served in the fleet against the Dutch, but with no distinction. On his return his health failed, and he died of droopy. He was buried in Westminster abbey, and the king attended his funeral. His titles and estates descended to his son Christopher, who died without issue in

1688, and the family became extinct the same year that saw the final fall of the royal house which George Monk had vainly restored to the British throne. Guizot says of Monk: "He was a man capable of great things, though he had no greatness of soul."—See Skinner, "Life of Monk" (London, 1751), and Guizot, *Monk, chôte de la république et rétablissement de la monarchie en Angleterre* (Paris, 1851; English translation, edited by Lord Wharncliffe).

MONK, JAMES HENRY, an English prelate and author, born in Huntingford, Herts, early in 1784, died at his palace, Stapleton, near Bristol, June 6, 1856. He was a nephew of Sir James Monk, formerly chief justice of Montreal. He studied at the Charterhouse, and at Trinity college, Cambridge, of which he became a fellow in 1805. In 1807 he became assistant tutor, and in 1808 succeeded Porson as regius professor of Greek, but resigned that office on his promotion to the deanery of Peterborough in 1822. In 1830 he became bishop of Gloucester at the recommendation of the late duke of Wellington. He was a devoted member of the high church party, but took little part in political debates in the house of lords. His principal work is the "Life of Bentley" (3 vols. 4to., 1831), of which a second and revised edition appeared in 1838. In conjunction with the late bishop of London he published *Ricardi Porsoni Adversaria* (1812), and excellent editions of the *Alcestis* and *Hippolytus* of Euripides.

MONKEY, the common name of the family *simiadae* of the order *quadrumana*. The teeth are 82 to 86 in number, and more or less approximate; the canines are larger than the incisors, the upper ones separated by a considerable interval from the latter; the face denuded; the fore feet often larger than the hind, and the middle finger of both hands and feet the largest; opposable thumbs on fore and hind limbs, chiefly formed for grasping; mammae pectoral, 2 or 4; stomach simple. Their food consists of vegetables and insects. Their habits are generally arboreal, and their habitats the forests of tropical America, Asia, and Africa. The monkeys of the new world are entirely distinct from those of the old; the former have been called *simia platyrrhini*, or broad-nosed monkeys, and the latter *simia catarrhini*, or narrow-nosed monkeys.—The *platyrrhini* have the nostrils wide apart, on the sides of the nose as it were; they have no cheek pouches nor callosities on the rump, and their long tails are generally prehensile; the hands have either 4 or 5 fingers, the first or thumbs very slightly if at all opposable; the teeth are: incisors $\frac{1}{2}$, canines $\frac{1}{2}$, molars $\frac{3}{2}$ = 86; they inhabit the warm parts of South America. The marmosets have been described under that title, and the remainder of the tribe may be divided into howlers and sapajous. The howling monkeys belong to the genus *myocetes* (Illiger), and are characterized by a pyramidal head, bearded face, pentadactylous hands and feet, and tail naked at the end on the lower surface; the lower jaw is very

high, and the hyoid bone is expanded into a kind of drum, which renders the voice so resonant and loud that their troops make a most frightful noise during the night, leading the traveller to think that all the wild beasts of the forest are engaged in fighting for their prey; they are the largest and fiercest of the American monkeys, resembling the baboons in disposition and facial angle, and the gibbons (*hylobates*) in their noisy and gregarious habits. The species are most abundant in Guiana and Brazil, where 80 or 40 are often seen on a single tree. The brown howler or araguato (*M. urinus*, Humb.) is reddish brown, with long hair and beard, and bluish black face; it is nearly 8 feet long, exclusive of the tail. The red howler (*M. seniculus*, Ill.) has a redder tinge to the hair, with black face, and nearly bare under parts. There are several other species. The sapajous are more slender in form, with flatter faces, longer tails, and milder dispositions than the howlers, resembling the genouens or long-tailed monkeys of the old world. In the genus *ateles* (Geoffroy), the head is rounded, the limbs very long and slender, the fore hands without thumbs, or with very rudimentary ones, and the tail long and prehensile and bare at the tip beneath. The coaita (*A. paniscus*, Geoffr.) is entirely black; they are timid, mild animals, rather sluggish when not excited, but exceedingly agile among the trees; as they swing from the branches by their tails they look not unlike large black spiders, and are commonly called spider monkeys; the tail is not only a 5th hand for purposes of progression, but an exquisite organ of touch. There are several species, which live in troops on the banks of the Amazon and Orinoco. *Lagothrix* (Geoffr.) differs from the last chiefly in the hands having a thumb and in the greater fineness of the hair; the *L. Humboldtii* (Geoffr.) is of a grayish black color, about 2 feet long, with the prehensile tail longer than the body. In the genus *cebua* (Geoffr.) the head is rounded, and the long tail is hairy throughout and prehensile; the monkeys of this genus are very active, excellent climbers, with well formed hands; the size is small, the disposition mild and playful, and the habits gregarious. The horned sapajou (*C. fatuellus*, Geoffr.) is blackish brown, with the face surrounded with whitish, and the hair of the forehead rising in 2 lengthened tufts above the eyes. The capuchin monkey (*C. capucinus*, Erxl.) varies from grayish white to olive, with a black crown like a monk's cap. The weeper monkey (*C. apella*, Geoffr.), so called from its plaintive cry, is deep brown above, with darker feet, crown, and tail, and lighter around the face. The white-throated sapajou (*C. hypoleucus*, Geoffr.) is black, with the front and sides of the head, throat, and shoulders white; it exhales an odor of musk. There are several other species, all lively and mild in disposition, inhabiting Guiana. In the genera hitherto alluded to, the nails are flattened and rounded; in the next three they more resemble claws, and

the animals included in them have more carnivorous propensities, eating meat, insects, and small birds which they seize. In *callithrix* (Geoffr.), of which the type is the siamiri or squirrel monkey (*C. sciureus*, Geoffr.), the ears are proportionately large, the body slender, the tail longer than the body, entirely hairy, and not prehensile; the color is grayish brown, lighter beneath, with reddish limbs and black muzzle; the body is 7 or 8 inches long, and the tail 10 or 12. Other species are described, all active and beautiful animals, with carnivorous propensities; they inhabit principally Brazil and Guiana. In *aotes* (Humboldt) the 2 middle upper incisors are broad, and the canines moderate; the eyes large; hind feet longest; tail longer than the body, not prehensile; nocturnal in its habits, living in pairs, resembling the lemurs of S. Africa. The douroucouli (*A. trivirgatus*, Humb.) is covered with a soft grayish white fur, with a dorsal brown line, 8 dark stripes on the head, and is yellowish brown below; it looks more like a cat than a monkey, and the mouth is surrounded by bristly white hairs; the body is about 9 inches and the tail 14; it sleeps during the day, and is active at night; the position when seated is like that of a dog, and when sleeping the head is bent forward between the feet; it is difficult to tame, and its voice is loud and disagreeable. The last genus which need be mentioned of the American monkeys is *pithecia* (Desm.), characterized by a round head, short muzzle, long canines, tail generally shorter than the body, entirely hairy, and not prehensile; they are nocturnal and gregarious, greatly resembling human pigmies, and said to be active, strong, and almost untamable. The couzio or black saki (*P. satanas*, Humb.) is dusky black, with a purplish tinge beneath, and with the tail is about 2½ feet long. The monk saki (*P. chiroptera*, Humb.) is brownish red, and of all the American species bears the closest resemblance in its features to man; the expression of the face is fierce and melancholy, the chin is covered with a thick beard, and the eyes are large and sunken; it is said to drink from the hollow of the hand, and to be very careful not to wet its beard. The cacajao or black-headed saki (*P. melanocephala*, Desm.) is about a foot long; the color of the body is yellowish brown, with the head black; there is no beard, and the tail is so short that Spix has placed it in a new genus *brachyurus*; it is weak, inactive, and very timid. The yake (*P. leucocephala*, Audub.) is black with the head whitish; the hair is very long. These and several other species inhabit the woods of Guiana in troops, where they are generally called night or fox-tailed apes.—Of the old world monkeys, or *catarrhini*, the largest have been mentioned in the articles APE, BABOON, CHIMPANZEE, GORILLA, and MACAQUE; so that it only remains to notice the smaller and long-tailed species. This division of the monkeys has the same number of teeth as man, viz., 32, and similarly arranged, except that the

incisors are more prominent, and the canines larger and separated from the incisors; there is a thin septum between the nostrils, hard naked skin or callosities on the rump, pouches on the sides of the face between the cheeks and the jaws; they generally have tails, though these are absent in the larger anthropoid apes; they are found in the warmer parts of Asia and Africa, only one species being naturalized in Europe (the Barbary ape on the rock of Gibraltar). The first of the monkeys not already noticed, connecting the guenons or long-tailed monkeys with the gibbons or long-armed apes, is the *presbytis* or capped monkey; this has no cheek pouches, but has naked callosities, a long tail, and arms reaching to the knees. The *P. mitrula* (Eschs.) has the body 1½ feet long, and the tail about as long; the hair is bluish gray above and grayish white below, with a black line from the ears across the head; it is a native of Sumatra. In the African genus *colobus* (Ill.) there are no thumbs on the hands, and the limbs are long and slender as in the spider monkeys (*ateles*) of the new world. The king monkey (*C. polycomus*, Geoffr.) is remarkable for the long, coarse, and flowing hair on the head, like a full-bottomed perwig; the body is shining black, and the tail is pure white. Other species are described, all natives of Guinea and Sierra Leone. The proboscis monkey (*nasalis larvatus*, Geoffr.) has a short muzzle, but the nose is lengthened into a kind of proboscis 4 inches long, at the end of which the nostrils are placed; the body is thick and the limbs stout; there are cheek pouches and callosities, and the tail is longer than the body; the color is reddish brown, with lighter patches on the lower back, and the face black; the body is about 2½ feet long; they are very active and noisy, and inhabit in large troops the forests of Borneo. The Cochin China monkey, or douc (*lasiopyga nemata*, Ill.), is a very singularly marked species; the muzzle is slightly elongated, the face bare, the hands longer than the forearm with short and slender thumbs; it has cheek pouches, but no callosities, and the tail is long. The colors are brilliant, the upper part of the head being brown with a chestnut frontal band, long hair of cheeks dirty white, forearms and tail white, the hands and thighs black, legs chestnut, and body olive gray; it stands nearly 4 feet high. The first genus of the guenons is *semnopithecus* (F. Cuv.), with round head, flat nose, long limbs, short thumbs, small cheek pouches and callosities, slender form, very long and thin tail, and canines much longer than the incisors; they inhabit India and its archipelago. The *S. entellus* (F. Cuv.) has a body about 1½ feet long and the tail 2 feet; the hind limbs are much longer than the anterior; the color is yellowish white, paler beneath, with the face, forearms and hands, legs and feet, black; it appears slow, sad, and stupid when at rest, but when roused is extremely active; it is very sensitive to cold, and is therefore rarely seen in menageries. It is called

hominum by the Hindoos, and so venerated by them that it is considered a crime to kill one; it is believed that the person who should destroy one will surely die within the year; it occupies a conspicuous place among their divinities. The negro monkey (*S. maurus*, Horsf.) has soft and silky hair of a general black color, the lower parts, inner side of limbs, and base of tail grayish; the body is about 2½ feet long and the tail nearly as much, and the proportions are robust. They are numerous in the forests of Java, and are hunted by the natives, who use the fur for various decorative purposes. There are several other species in Sumatra. The genus *cercopithecus* (Erzl.) differs from the last in the larger facial angle, more elegant shape and coloring, longer posterior limbs, and milder and more affectionate disposition; it has only 4 tubercles to the last lower molar, instead of 5 as in *semnopithecus*. The varied monkey (*O. mona*, Geoffr.) is the handsomest of all; the body is chestnut, upper part of head bright yellowish green, cheeks yellow, outside of limbs and tail blackish, with a spot of white on the nates; it is a native of Africa, cunning, active, intelligent, and playful. The Diana monkey (*O. Diana*, Geoffr.) is so called from the white crescent on the forehead; the chin and throat are white; it is about 1½ feet long with a tail of 2 feet. The golden guenon (*O. auratus*, Geoffr.), from Asia, is golden yellow above, paler below, with a black spot on the knee. There are many other species, most, like the first two, from Africa. The mangabeys (*cercopithecus*, Geoffr.) begin to come near the baboons in the more lengthened muzzle and receding forehead, though they have the long tail of the guenons; they are found in Africa and India. The green monkey (*O. sabaeus*, Geoffr.) is a native of Africa and the Cape Verd islands, and is very often seen in captivity on account of its lively and playful manners; the color is olive green above, shading into white below, and the face is black. The malbrouck of Bengal (*O. cynomorphus*, Geoffr.) is olive brown above, shading into white, with a white band over the eyes; it is an excellent climber and very active, and is often seen in menageries. The white-eyelid mangabey (*O. fuliginosus*, Geoffr.) is of a sooty black color, with white and very conspicuous upper eyelids; it is a native of Africa. These and the numerous other species of Asia and Africa are generally easily domesticated when young; they are good-natured, playful, and free from the disgusting habits of the larger baboons.—The restriction of the *catarrhini* to the old and of the *platyrrhini* to the new world prevailed in the tertiary geological epochs. Fragments of a jaw and some teeth found in the eocene sand of Suffolk, England, were referred by Owen to the genus *macacus* under the name of *M. eocenus*; this furnishes a remarkable proof of the former more elevated temperature of Europe, monkeys having lived during the eocene period 15° further N. than at the present time. In the miocene of France, in lat. 48° N.,

were found portions of a jaw and teeth, very anthropoid in appearance, belonging to what De Blainville has called *pithecus antiquus*, which some have thought nearer to man than is the chimpanzee. Other fragments have been found in England, Greece, and France, which have been referred to the genera *macacus*, *pithecus*, and *semnopithecus*. In the Sivalik hills of India have been discovered specimens of *semnopithecus* nearly as large as the orangs, and some resembling baboons. In South America, M. Lund found in Brazil, in lat. 18° S., specimens which he referred to the genera *cebus*, *callithrix* *primæus* (twice the size of any living species), and *protopithecus Brasiliensis*, which must have attained a height of 4 feet; he also found there *ouistitis* (*J. grandis*) twice as large as any now living.

MONMOUTH, a central co. of N. J., bordering on the Atlantic ocean, drained by the Neversink, Shrewsbury, Shark, and Tom's rivers; area, about 800 sq. m.; pop. in 1855, 84,978. Its surface is generally level, with elevations toward the N. E. The productions in 1850 were 841,072 bushels of Indian corn, 152,904 of wheat, 778,372 of potatoes, 158,546 of oats, and 81,548 lbs. of wool. There were 32 grist mills, 20 saw mills, 4 woollen factories, 14 tanneries, 14 distilleries, 6 newspaper offices, 60 churches, and 6,029 pupils attending public schools. A railroad is in operation between Port Monmouth and Long Branch; and a branch railroad connects the capital, Freehold, with the Camden and Amboy railroad at Jamesburg.

MONMOUTH, BATTLE OF, an encounter between the American and British forces, the former commanded by Gen. Washington and the latter by Sir Henry Clinton, which took place at Freehold, Monmouth co., N. J., June 28, 1778. On June 18 Sir Henry Clinton, acting under peremptory orders from the British ministry, evacuated Philadelphia, which had been occupied by his army since the preceding September, and proceeded across New Jersey toward Brunswick, with a view of embarking on the Raritan. On hearing of this movement, Washington broke up his camp at Valley Forge, and, having sent forward some light troops to harass the enemy, started in pursuit. Owing to excessive heat the march of both armies was slow, and the British were moreover encumbered by a baggage train 12 miles in length. At Allentown Clinton suddenly turned to the right by a road leading through Freehold to Sandy Hook, to embark at the latter place; and Washington, who had hitherto been deterred by the advice of his officers, and particularly of Gen. Charles Lee, from attacking the enemy, determined at once to give him battle. The evening of the 27th found the main body of the enemy encamped on high ground near Monmouth court house in the town of Freehold, while the American advance, about 4,000 strong, under Lee, was posted at Englishtown, 5 miles distant, with the main body about 8 miles in the rear. The command of the advance had

originally been given to Lafayette, with the consent of Lee; but the latter subsequently applied for and obtained it. Early on the 28th Lee engaged the rear division of the enemy, his orders being to hold it in check until the main body under Washington could come up. The Americans were at first successful, but owing to causes which have never been satisfactorily explained, the whole body soon after fell into a confusion in which their commander seemed to participate, and commenced a disorderly retreat, closely followed by the British. Washington, who was advancing hastily with the main body, received the first intimation of this movement in the crowds of fugitives who poured along the road. Exasperated beyond measure at the failure of Lee to execute his orders or to apprise him of his retreat, he rode up to that general and reprimanded him with a vehemence which surprised those accustomed to the habitual self-control of the commander-in-chief. Then, rallying by his voice and presence the fugitives, he re-formed them on a piece of rising ground, and hastened back to bring up the main body. Lee, resuming his command, held his position with spirit until compelled to retire, and brought off his troops in good order. The main body, which had meanwhile taken a favorable position on an eminence, with a morass in front and a wood in the rear, opened an effective cannonade from both wings upon the British. The latter, after an ineffectual attempt to turn the American left under Lord Stirling, directed their chief efforts against the right commanded by Greene, where Wayne, under cover of an orchard, was harassing their centre by a severe fire. To dislodge him, Col. Moncton advanced with a column of royal grenadiers, but fell at the head of his troops, who were repulsed with considerable loss. The enemy at length fell back to the ground occupied by Lee in the morning, whither Washington was preparing to follow them when the approach of night and the exhaustion of his men induced him to defer the execution of his plan until the morning. During the night Clinton effected a noiseless retreat, and at daybreak was many miles away from the scene of battle. The excessive heat of the weather and the fatigued condition of the troops rendered a pursuit impracticable, and the royal army was suffered to proceed unmolested to the place of embarkation. The American loss in this engagement was 69 killed and 160 wounded; that of the British probably nearly 800 killed and 100 prisoners including wounded. Their total loss by desertions and the casualties of battle during their march through New Jersey has been estimated at 2,000. On both sides many men died from the effects of the heat alone. For his conduct in this battle Lee was court-martialled and suspended for one year from his command.

MONMOUTH, a market town and municipal and parliamentary borough of England, capital of Monmouthshire, situated in a picturesque valley at the confluence of the Wye and Mon-

now, 129 m. N. W. from London; pop. in 1851, 5,710. The Wye fisheries in the vicinity are flourishing. The borough, in conjunction with Newport and Usk, sends one member to parliament. Henry V. (Harry of Monmouth) and Geoffrey the chronicler were natives of this town. The battle of Monmouth, in which Owen Glendower was defeated by Henry, prince of Wales, was fought May 11, 1405.

MONMOUTH, GEOFFREY OF. See GEOFFREY.

MONMOUTH, JAMES SCOTT, duke of, a supposed son of Charles II., king of Great Britain, born in Rotterdam, April 9, 1649, executed in London, July 15, 1685. His mother was Lucy Walters, daughter of a gentleman of Pembroke-shire. She was first the mistress of Algernon Sidney, who was then a colonel in the parliamentary army, and next of his brother, Col. Robert Sidney, with whom she became acquainted in Holland. Robert Sidney was by some reputed the father of Monmouth. Charles was then in Holland, and Lucy Walters became his mistress. He acknowledged her son to be his offspring, and was throughout life strongly attached to him. The boy was known as James Crofts, because he was for some time in the charge of Lord Crofts, and passed for his relative. When he was taken to England, in 1662, he was very accomplished and very handsome. The king treated him as kindly as if he had been his legitimate son. He was first made duke of Orkney, but the title was changed to that of Monmouth. He was also created baron of Tyndale and earl of Doncaster at the same time, Feb. 19, 1663; and on March 28, 1663, he was elected a member of the order of the garter. Oxford and Cambridge conferred on him the degree of A.M. He served on board the fleet of the duke of York in 1665, and was in the battle of Lowestoffe, June 3. In 1667 he was married to Anne Scott, daughter and sole heir of Francis Scott, earl of Buccleugh. He and his wife were created duke and duchess of Buccleugh, earl and countess of Dalkeith, and baron and baroness of Whitchester and Ashdale in Scotland, in 1678. He was made master of the horse about the date of his marriage, and captain of the horse life guards in 1668; and on the death of the duke of Albemarle, in 1670, he succeeded him as captain-general of all the king's fortresses. He became a privy councillor the same year. He was allowed privileges at court which could be claimed only by persons of the blood royal. The people, who loved him because of his amiability, bravery, and personal beauty, were led to believe him the king's legitimate son. They forgave him the part he had in the licentiousness of the period, and also when he caused Sir John Coventry to be brutally mutilated for having spoken severely of the king's conduct in parliament. At first, Monmouth and his uncle, the duke of York, were friends, but they soon became rivals in love and politics. Those persons who dreaded the accession of York to the throne (the king having no legitimate children, nor expecting

any) endeavored to have Monmouth recognized as heir presumptive; and they hinted to Charles II. that it would not be difficult to have his marriage with Lucy Walters proved by competent false witnesses; but the king promptly replied that, "much as he loved the duke, he had rather see him hanged at Tyburn than own him for his legitimate son." When England joined France in the war against Holland, Monmouth was sent at the head of 8,000 troops to act under Louis XIV. in 1679. He served in two campaigns with considerable distinction, and was made a lieutenant-general by the French king, who gave him a splendid sword. In 1674 he was elected chancellor of the university of Cambridge. When England changed her policy, and joined the Dutch, Monmouth was continued in his position as lord-general of the king's forces in Flanders, and took part in the battle of St. Denis. He had been made commander-in-chief of the armies of England and Scotland, and was known as "the Protestant duke." On the breaking out of the delusion known as the popish plot, he was among its encouragers, and his designs on the succession to the throne were much favored by Shaftesbury and his associates, and by the extreme unpopularity of the duke of York, heir presumptive, who was a Catholic, and who was compelled to leave the country. On the revolt of the Scotch Covenanters in 1679, Monmouth was sent to act against their forces, and defeated them, June 22, at Bothwell Brig. As he treated the rebels mildly, and would willingly have spared them all, he was accused of favoring rebellion. His entire conduct in Scotland was statesmanlike, and in strong contrast with that of Lauderdale and Claverhouse. Monmouth was compelled to resign his office of lord-general, and to go to Holland. Thence he returned to England without leave, and upon his refusal to quit the kingdom his offices were taken from him. He now became the principal person of the opposition to the court, and his pretensions to the crown were vigorously but not wisely pressed by his followers, rather on a popular than on a legal basis; but when the duke of York returned to court, the story of the marriage of Charles II. and Lucy Walters was gravely urged, and the king deemed it necessary to deny it in the most public and formal manner. The part he had in the conspiracies of 1683 led to his flight to Holland, after considerable negotiation with the king for pardon. He was well received at the Hague, and was in expectation of an early recall to England, and a full restoration to the king's favor, when Charles II. died, Feb. 6, 1685. He left the Hague, but instead of following the wise counsel of the prince of Orange, which was to enter the imperial service, he allowed himself to be deluded by the suggestions of British exiles, and placed himself at the head of a small expedition, which left Holland, and arrived at Lyme Regis, June 11, 1685. At first the duke met with some success; but being joined only by persons from the lower

ranks, and the government acting with great energy, his forces were beaten at Sedgemoor, July 6, and on the 8th he was captured and taken to London, where he had an interview with James II., of whom he begged his life in abject terms; but the king refused his request, and he was executed under an act of attainder two days after his arrival in the capital. His followers continued to believe that he was alive for many years, and it was supposed by some that he was the man with the iron mask who was so long a prisoner in the Bastille. His wife, a woman of superior talents, from whom he had been separated, survived him nearly 47 years, and married Charles, third Lord Cornwallis. Monmouth is the Absalom of Dryden's "Absalom and Achitophel."

MONMOUTHSHIRE, a maritime county of England, bounded S. by the Bristol channel and the estuary of the Severn; area, 576 sq. m.; pop. in 1851, 157,418. The coast, which is 22 m. in extent, is exposed to the high spring tides that rush up the Severn from the Bristol channel, and sometimes attain an altitude of 60 feet. Vast sea walls and earth works have been erected. The surface toward the N. is mountainous and rocky; adjoining the Severn and the sea is a spacious plain, which the river Usk divides into two parts, called the Wentloog and Caldecot levels. The principal mountains are: Penny-Val, or the Sugar Loaf, 1,856 feet high; Blawrenge mountain, 1,720 feet; and Skyrryd Vawr, or Holy mountain, 1,498 feet. The chief rivers are the Wye, Usk, and Monnow, the two former of which are famous for their salmon. The soil of the vales and plains is generally fertile. Iron, coal, lead, and building stone are produced. The average proportion of iron yielded by the ore is from 18 to 55 per cent. The principal iron works are the Rumney, Tredegar, Victoria, Pentwyn, and Beaufort. The iron and coal of this county are almost entirely shipped at Newport. The area of its mineral districts is estimated at 99,000 acres. The county returns 2 members to parliament. Chief towns, Monmouth, the capital, Newport, Abergavenny, and Chepstow. Monmouthshire was originally a part of South Wales, and the Welsh language is still largely in use there.

MONOD, JEAN, a French Protestant clergyman, born in Switzerland about 1760, died in Paris in 1886. He was descended from a family of Huguenots, and officiated as pastor of the Reformed church in Paris until the outbreak of the first revolution, when he removed to Copenhagen, where he became the pastor of a small church, and where he married. While in Copenhagen the duke of Orleans, the future king Louis Philippe, enjoyed his hospitality, and afterward welcomed him to Paris, Monod having been repeatedly delegated by the Protestants of Paris to present the annual congratulations to the king. His widow, who was a woman remarkable for her intelligence and force of character, died in 1851.—**FREDERIC**, D.D., eldest

son of the preceding, born near Morges, Switzerland, May 17, 1794, received his theological education at Geneva, and after the death of his father became pastor of the Oratoire in Paris. From his ability as a preacher and his high character, he was regarded as a leader among the evangelical Protestants of France. After having officiated in the Oratoire for upward of 20 years, he seceded from the national Protestant church, April 22, 1849, not because it was recognized by the state, but because it did not insist upon "the acknowledgment of Christ as a divine Saviour" as a condition of membership. In his farewell sermon he says: "Whatever may be written or said to the contrary, I retire upon this ground, and not upon the question of a separation of church and state, nor any question of ecclesiastical discipline, nor any minor consideration whatever." In thus breaking off from the church Dr. Monod sacrificed a position of comparative affluence, honor, and influence. In conjunction with a small but influential body of evangelical Christians, he immediately set about the organization of the free church of France, resembling in some respects the free church movement in Scotland. In 1858 he visited the United States in order to enlist the sympathies of Americans in the movement. He is the editor of the *Archives du Christianisme*. He has a large family, and two of his sons are in the ministry. One of them studied theology at the Presbyterian (O. S.) seminary at Alleghany City, Penn., and afterward officiated as preacher in St. Anne, Kankakee co., Ill.—ADOLPH, a brother of the preceding, born Jan. 21, 1802, died in Paris in 1856. He was also educated at Geneva, and held to the same views in regard to the divinity of the Saviour as his brother Frédéric, yet remained in the national church. In early life he became one of the pastors of the Reformed church in Lyons, whence he was dismissed in consequence of his rigid adherence to evangelical principles. He was afterward professor in the theological school at Montauban, and in 1849, on the secession of his brother from the national church, he was invited to fill his place at the Oratoire, with Athanèse Coquerel as his colleague. He held this position until his death, and gained a high reputation for pulpit eloquence. He is the author of "Lucille," "Woman's Mission," "Sermons," and other works, several of which have been translated into English.—GUILLAUME and HORACE, brothers of the preceding, are also favorably known in the French Protestant world. The former was pastor in Switzerland, in France, and in Algeria; and the latter has been for a long time established as pastor in Marseilles.

MONOGRAM (Gr. *μονος*, single, and *γραμμα*, letter), a character or cipher, formed by interweaving the initials or other letters of a name. Monograms were common in antiquity, especially on the coins of the Greeks. They came into general use in the countries subject to Charlemagne, not only on the coins, but the ecclesiastical and temporal lords chose each a monogram

for their signature. The explanation of mediæval monograms is important in the criticism of historical monuments and documents, and forms a special branch of diplomatics. An example of oriental monograms is the *thogra*, a figure on the coins of Turkey, in which the imperial name and insignia are obscurely involved. The signature which painters, engravers, and other artists inscribe upon their works is usually a monogram. The monogram of Christ, with which paintings, coins, tombs, precious stones, seals, rings, and ecclesiastical documents were adorned in the middle ages, is formed from the first two Greek letters of the name, X and P, thus,

✠ It may be traced to the age of Antoninus Pius, and precisely the same conjunction of the letters appears on heathen monuments previous to the Christian era. With the monogram were often combined the letters alpha and omega, to indicate that Christ was the beginning and end of all things. Abbreviations of his name and titles were also employed, as I. H. S., *Jesus hominum Salvator*. A mystical word or figure was often used instead of the monogram, as *Ixθys* (a fish), formed from the initials of *Iησους Χριστος Θεου Υιος Ζωνων*. The figure of the fish sometimes took the place of the name.—See Bandis, *Ad Analysisin Monogrammatum* (Leipzig, 1787); Brulliot, *Dictionnaire des monogrammes* (new ed., 1832-'4); and Binterim, *Die vorzüglichsten Denkwürdigkeiten der Christkatholischen Kirche* (7 vols., Mentz, 1835-'45).

MONOMANIA. See INSANITY.

MONONA, a W. co. of Iowa, separated from Nebraska by the Missouri river, and intersected by the Little Sioux; area, about 900 sq. m.; pop. in 1859, 885. It is covered with prairie, and has a fertile soil. The productions in 1859 were 43,445 bushels of Indian corn, 1,566 of wheat, 2,586 of oats, 113 of potatoes, 1,532 tons of hay, and 13,771 lbs. of butter.

MONONGAHELA RIVER, one of the head branches of the Ohio, formed by the union of the West fork and Tygart's Valley river in Marion co., Va., flows N. into Pennsylvania, where it receives the Cheat river, its principal tributary, and unites with the Alleghany to form the Ohio at Pittsburg; length, exclusive of branches, about 150 m., or including the Tygart's Valley river or East fork (which rises in Randolph co., Va.), 300 m. At its mouth the width is nearly 400 yards. It is navigable for large boats to Brownsville, Penn., 60 m. from its mouth, and for small boats to Fairmont, Va., at its head.

MONONGALIA, a N. W. co. of Va., bordering on Penn., and intersected by Monongahela and Cheat rivers; area, about 500 sq. m.; pop. in 1850, 12,387, of whom 176 were slaves. The surface is uneven, being mountainous toward the E., where it is crossed by Laurel hill, an extreme western ridge of the Alleghanies; the soil is generally fertile. The productions in 1850 were 184,379 bushels of Indian corn, 111,252 of oats, 52,370 of wheat, 29,129 lbs. of wool, and 3,750 of tobacco.

There were 25 grist mills, 17 saw mills, 2 iron founderies, 8 furnaces, 81 churches, and 548 pupils attending public schools. Value of real estate in 1856, \$2,997,075, showing an increase of 25 per cent. over 1850. Capital, Morgantown.

MONOPHYSITES (Gr. *μονος*, single, and *φύσις*, nature), a sect who rejected the doctrinal decision of the council of Chalcedon (451), that there are in the one person of Christ two natures without confusion, but inseparably united, and maintained in opposition to it that there is in Christ only one nature, the divine one, which has become flesh. The forerunner of this sect was Eutyches, who maintained that every thing human in the nature of Christ was absorbed by his divinity and became one nature with it. This doctrine of Eutyches was condemned by a synod of Constantinople, held under Bishop Flavianus in 448, approved in the following year by the so called robber synod of Ephesus under the presidency of the patriarch Dioscurus of Alexandria, but in 451 again anathematized by the œcumenical council of Chalcedon. An Alexandrian monk, Theodosius, who had been present at the council of Chalcedon, induced about 10,000 monks of Palestine to refuse submission to the decrees of the council. They were willing to reject Eutychianism, but at the same time opposed the Chalcedonian doctrine, as inevitably leading to Nestorianism. They received from their opponents the name Monophysites, while they in turn called the adherents of Chalcedon Nestorians or Diophysites. The Monophysites soon took possession of the patriarchate of Jerusalem, but the emperor restored it to the Catholic party in 453. In Egypt, where 13 bishops had protested from the beginning against the Chalcedonian decrees, the Chalcedonian patriarch was murdered in a tumult, and Timotheus Melus, a Monophysite, appointed in his stead (457). In Antioch a leader of the Monophysites was raised to the patriarchal dignity after the Chalcedonian patriarch had been prevailed upon to resign. The usurper Basiliscus (476) patronized the Monophysites, but after his defeat (477) the Catholic party again gained the ascendancy. The emperor Zeno, following the advice of the patriarch Acacius of Constantinople, made an attempt to reconcile the parties by means of a creed called *Henoticon* (482), which entirely avoided the disputed articles; but this scheme found opponents among both parties. Felix II., the bishop of Rome, excommunicated Acacius as its author, and the extreme Monophysites in Egypt broke off ecclesiastical communion with the patriarch Peter Mongus, who had accepted the *Henoticon*. Justin I., and still more decidedly Justinian, employed severe measures for the suppression of Monophysitism, which found, on the other hand, an ardent supporter in Theodora, the wife of Justinian, who even made (538) an unsuccessful effort to fill the see of Rome with a Monophysite. Previously (533) Justinian had tried in vain to effect a union by allowing the Monophysites to use their formula

that one of the Trinity was crucified. When the Monophysites invoked for their support the authority of Origen, the Catholic party procured from the emperor the condemnation of his writings. Monophysites, on the other hand, induced the emperor to condemn the teachings of three of their chief opponents, of the Antiochian school, and thus to throw an apple of discord among the Chalcedonian party. An œcumenical council, convoked by the emperor at Constantinople in 553, confirmed the condemnation of Monophysitism on the one hand, and of the "three chapters," the epitome of the doctrines of the three Antiochian teachers, on the other. The Monophysites, in the mean while, had fallen out among themselves; some (the Severians) maintaining the corruptibility, others (the Julianists) the incorruptibility of the body of Christ. By adopting the latter doctrine Justinian made (in 564) a last attempt to draw over the Monophysites, but with no other result than to cause a new split among the Catholic bishops. Under his successor the efforts to make the Monophysites accept the decrees of Chalcedon were given up, and they organized as an independent body. The zeal of Jacobus Baradaeus, who in 541 was ordained bishop of Edessa, gave them in Syria and Mesopotamia a permanent organization with a patriarch, claiming to be the legitimate successor of the Antiochian patriarchs, at their head. They also received from him the name Jacobites, by which they were henceforth commonly called. (See **JACOBITES**.) As early as 527, the bishops of Armenia rejected at a national synod, under the presidency of their patriarch Nerses, the decrees of Chalcedon, and organized, on a Monophysitic basis, an independent church. (See **ARMENIAN CHURCH**.) In Egypt nearly all the churches adopted Monophysitism; the few adherents of the imperial decrees were called Melchites (*i. e.*, royalists), while the Monophysites received the name of Coptic (*i. e.*, Egyptian) Christians. (See **COPTS**.) With this latter branch of Monophysitism, the Abyssinian church is in organic connection. Some smaller branches of these four Monophysitic churches spread in other parts of western and in central Asia, without, however, obtaining any importance.—The history of the Monophysites is most amply treated of by Walch, in his *Ketzerhistorie*, vols. vi., vii., and viii. An extensive extract from this work is given in Schröckh's *Kirchengeschichte*, vol. xviii. Writings and fragments of the party leaders are contained in Mai's *Scriptorum Veterum Nova Collectio*, vol. vii. (Rome, 1838), and *Spicilegium Romanum*, vol. vii.

MONOTHELITES (Gr. *μονος*, single, and *θελα*, to will), the name of a sect which accepted, in accordance with the council of Chalcedon, the doctrine of two natures in the person of Christ, but maintained that there was but one manifestation of will. The emperor Heraclius, following the advice of the patriarchs Cyrus of Alexandria and Sergius of Constantinople, hoped, by means of a formula expressing these views,

to reunite the Monophysites with the orthodox church. The attempt proved partly successful; but the resolute opposition of the patriarch Sophronius of Jerusalem reopened the controversy on the person of Christ throughout the church. An imperial edict, *Ektthesis* (639), composed by Sergius, patriarch of Constantinople, and approved by Pope Honorius, which proclaimed that there was but one Christ and but one will, seemed to secure the ascendancy of the Monothelites. But after the death of Honorius, the bishops of Rome placed themselves at the head of the opposition, and a new decree of the emperor Constans II., called *Typos* (648), designed to enforce peace by a prohibition of the controversy, had not the desired effect. The first council of Lateran (649) under Pope Martin I. condemned the Monothelites and the two imperial laws. The pope suffered imprisonment for this decree, but some years later (680) the sixth oecumenical council, held at Constantinople, recognized in Christ two wills made one by the moral subordination of the human, excommunicated Macarius, patriarch of Constantinople, and other leaders of the party, and "anathematized the former pope Honorius, because he had shared the impious opinions of the patriarch Sergius of Constantinople." The Monothelites obtained once more a transient victory under Philip Bardanes (711-718), who had been brought up by the patriarch Macarius; but after the elevation of Anastasius II. to the throne, all the Monothelites were forced to submit, and the sect maintained itself only in a corner of Asia, outside of the Byzantine boundaries, until the 12th century, when they united with the Roman Catholic church. (See MARONITES.)—A *Historia Hæresis Monothelitarum* has been written by Combesis, in his *Auctuarium Patrum*, vol. ii. (Paris, 1648).

MONOTREMATA (Gr. *monos*, single, and *rema*, opening), an order of implacental mammals, or those in which the embryo forms no vascular connection with the uterus; the name is derived from the fact that the intestinal, generative, and urinary organs open into a common cloaca, as in birds and reptiles. The order includes the ornithorhynchus and the porcupine ant-eaters (*echidna*), from Australia and Tasmania. They are the lowest mammals, and have many characters of birds and reptiles in their structure and mode of reproduction; they have no abdominal pouch, but the marsupial bones are present; at the top of the breast bone is an episternum with lateral arms forming the chief support of the scapular arch, on the top of which the true clavicles, like the furcular bone of birds, are situated; the coracoid bones extend also to the sternum, and are surmounted by epicoracoid bones; in the scapular arch, therefore, they resemble in some respects birds, in others lizards and anolisaurians. The eyes are very small, the external ears absent, and the face projects in the form of a naked beak, without teeth or soft movable lips; the teeth are replaced by small horny plates; some au-

thors, as Wagner, have ranked them among edentates. The feet are 5-toed, with long nails; the males have a long spur on the hind legs, the groove of which communicates with a glandular organ, whose secretion has been erroneously supposed to be poisonous; the mammary orifices are mere slits in the skin of the abdomen, without elevated nipples, and the female sexual organs resemble those of birds; the young are born alive, and are suckled as in other mammals; the cæcum is small; the lungs are spongy and cellular, and enclosed in a thoracic cavity separated from the abdomen by a diaphragm; in the brain there is no *corpus callosum*, and the bigeminal bodies are simple. (See ORNITHORHYNCHUS, and PORCUPINE ANT-EATER.)

MONRO, ALEXANDER, an English physician and anatomist, born in London in 1697, died in Edinburgh, July 10, 1767. He studied at Edinburgh, London, and Leyden, and in 1720 began at Edinburgh, in connection with another young physician named Alston, a course of lectures on anatomy and materia medica, which were the first regular lectures on the medical sciences that had ever been delivered in that city. On the foundation of the Edinburgh faculty of medicine in 1721, Dr. Monro was appointed professor of anatomy, but was not inducted into office till 1735. The royal infirmary of Edinburgh was founded under his direction, and he lectured there on surgical science till 1759, when he resigned his lectureship to his son. His most important work is "Osteology, or a Treatise on the Anatomy of the Bones" (1726), which has been translated into many foreign languages. Some of his contributions to scientific journals were reprinted under the titles "Medical Essays and Observations" and "Essays Physical and Literary." A collective edition of his works, with a memoir by his son, was published at Edinburgh in 1781.

MONROE, the name of 16 counties in the United States. I. A N. W. co. of N. Y., bounded N. by Lake Ontario, and drained by the Genesee river; area, 682 sq. m.; pop. in 1855, 96,324. The surface is generally level, with a slight inclination toward the lake. The soil is very fertile, and agriculture is the leading pursuit. The productions in 1855 were 2,653,080 bushels of wheat, 654,551 of potatoes, 58,738 tons of hay, 1,643,515 lbs. of butter, and 131,253 lbs. of cheese. The New York central, the Rochester, Lockport, and Niagara Falls, the Rochester and Charlotte, and the Auburn and Canandaigua railroads meet at Rochester, the capital. II. An E. co. of Penn., separated on the E. from New Jersey by the Delaware river, and drained by Tobyhanna and Broadhead creeks; area, 600 sq. m.; pop. in 1850, 13,270. The surface in some parts is mountainous, and the soil of the valleys is rich. Limestone and slate are found in the county. The productions in 1850 were 101,829 bushels of Indian corn, 14,620 of wheat, 67,435 of oats, 10,253 tons of hay, and 174,204 lbs. of butter. There were 30 flour and grist mills, 20 saw mills, 11 tanneries, 18 churches, 2 newspaper offices, and

3,199 pupils attending public schools. The Delaware, Lackawanna, and western railroad passes through Stroudsburg, the capital. III. A S. W. co. of Va., drained by Greenbrier and New rivers; area, 450 sq. m.; pop. in 1850, 10,204, of whom 1,061 were slaves. It has an elevated surface, and is bounded on the E. and S. by the main branch of the Alleghanies. It is one of the finest grazing counties in the state. The productions in 1850 were 250,456 bushels of Indian corn, 51,436 of wheat, 97,460 of oats, 6,078 tons of hay, and 175,254 lbs. of butter. There were 4 flour mills, 5 saw mills, 1 woollen factory, 5 tanneries, 27 churches, and 498 pupils attending public schools. Value of real estate in 1856, \$3,272,510, being an increase of 47 per cent. since 1850. Capital, Union. IV. A central co. of Ga., bounded E. by the Ocmulgee river, and drained by several branches; area, 370 sq. m.; pop. in 1859, 15,812, of whom 9,960 were slaves. The surface is diversified, and much of the soil fertile. Gold, iron, granite, and plumbago are found. The productions in 1850 were 15,012 bales of cotton, 724,670 bushels of Indian corn, 108,766 of oats, and 166,584 of sweet potatoes. There were 36 churches, 1 newspaper office, and 750 pupils attending public schools. The Macon and western railroad passes through Forsyth, the capital. V. A S. co. of Fla., forming the W. half of the extremity of the peninsula, bounded W. by the gulf of Mexico, S. W. by the bay of Ponce de Leon, N. by the Caloosahatchee river, and N. E. by Lake Okeechobee; area about 3,500 sq. m.; pop. in 1850, 2,645, of whom 481 were slaves. In the S. part of the county lie the "Thousand Isles," and the Florida Keys are included in it. The surface is mostly flat and marshy, and is partly occupied by the everglades. The orange and the cocoa palm are indigenous. The productions are confined almost entirely to a few sweet potatoes, and most of the population centres at Key West, the capital. VI. A S. W. co. of Ala., drained and bounded on the S. W. by the Alabama river; area, 960 sq. m.; pop. in 1850, 12,018, of whom 6,525 were slaves. The surface is moderately uneven and partly occupied by pine forests. The productions in 1850 were 6,977 bales of cotton, 409,506 bushels of Indian corn, 140,985 of sweet potatoes, and 100,031 lbs. of rice. There were 7 grist and saw mills, 1 turpentine manufactory, 8 tanneries, 26 churches, and 232 pupils attending public schools. Capital, Claiborne. VII. A N. E. co. of Miss., bordering on Ala., and intersected by the Tombigbee river; area, 950 sq. m.; pop. in 1850, 21,172, of whom 11,717 were slaves. The surface is a level plain or savanna, with few trees, and covered with rank grass. The soil is a rich, calcareous loam. The productions in 1850 were 17,814 bales of cotton, 901,186 bushels of Indian corn, and 168,860 of sweet potatoes. There were 20 churches, 2 newspaper offices, and 600 pupils attending public schools. The Jackson and great northern railroad passes through Aber-

deen, the capital. VIII. An E. co. of Ark., watered by Cache and White rivers; area, 1,040 sq. m.; pop. in 1854, 2,569, of whom 899 were slaves. The surface is generally level, and occupied by cypress swamps and plantations of cotton and maize. The productions in 1854 were 89,650 bushels of Indian corn, 8,559 of oats, and 1,520 bales of cotton. Capital, Lawrenceville. IX. A S. E. co. of Tenn., bordering on N. C.; area, 500 sq. m.; pop. in 1850, 11,784, of whom 1,188 were slaves. It is drained by Tellico river, an affluent of the Little Tennessee. The Unaka or Smoky mountains lie on the S. E. border of the county. The soil is moderately fertile. The productions in 1850 were 671,167 bushels of Indian corn, 177,519 of oats, 42,499 of wheat, and 72,207 lbs. of butter. There were 16 churches, and 1,969 pupils attending public schools. The East Tennessee and Georgia railroad passes through the county. Capital, Madisonville. X. A S. co. of Ky., bordering on Tenn., and drained by the head streams of Big Barren river, and by the Cumberland river; area, 600 sq. m.; pop. in 1850, 7,756, of whom 881 were slaves. The surface is diversified, and the soil fertile. The productions in 1850 were 384,705 bushels of Indian corn, 12,449 of wheat, 77,151 of oats, and 392,762 lbs. of tobacco. There were 15 churches, and 899 pupils attending public schools. Capital, Tompkinsville. XI. A S. E. co. of Ohio, separated from Virginia by the Ohio river, and drained by Little Muskingum river and by Seneca and Sunfish creeks; area, 420 sq. m.; pop. in 1850, 28,851. The surface is hilly and well timbered. It contains beds of coal and some iron. The productions in 1850 were 617,667 bushels of Indian corn, 148,351 of wheat, 224,800 of oats, 3,681,705 lbs. of tobacco, and 6,798 tons of hay. There were 72 churches, 1 newspaper office, and 5,409 pupils attending public schools. Capital, Woodfield. XII. A S. E. co. of Mich., bordering on Lake Erie and Ohio; area, 540 sq. m.; pop. in 1850, 14,698. Huron river forms its N. W. boundary, and the Raisin river traverses the county. The surface is level and diversified by prairies and woodlands. The valley of Raisin river is celebrated for fertility and beauty. The productions in 1850 were 114,600 bushels of wheat, 198,818 of Indian corn, 78,248 of potatoes, and 18,191 tons of hay. There were 5 churches, 3 newspaper offices, and 3,317 pupils attending public schools. The Michigan central railroad passes through Monroe, the capital. XIII. A S. W. co. of Ind., watered by White river and its branches; area, 420 sq. m.; pop. in 1850, 11,386. The surface is hilly, and the soil fertile. The productions in 1850 were 710,465 bushels of Indian corn, 61,146 of wheat, 92,385 of oats, and 3,078 tons of hay. There were 24 churches, 8 newspaper offices, and 2,439 pupils attending public schools. The New Albany and Salem railroad passes through Bloomington, the capital. XIV. A S. W. co. of Ill., bounded W. by the Mississippi river; area, 860 sq. m.; pop. in 1855, 10,285.

The surface is moderately uneven, and the soil is fertile. In 1850 the productions were 899,250 bushels of Indian corn, 89,856 of wheat, and 58,546 of oats. There were 16 churches, and 789 pupils attending public schools. Capital, Waterloo. XV. A N. E. co. of Mo., watered by Salt river and its branches; area, 744 sq. m.; pop. in 1856, 10,858, of whom 2,832 were slaves. The surface consists in part of rich undulating prairies. The productions in 1850 were 798,145 bushels of Indian corn, 48,669 of wheat, 180,412 of oats, and 629,412 lbs. of tobacco. There were 25 churches, and 1,954 pupils attending public schools. The county abounds in coal, limestone, and freestone. Capital, Paris. XVI. A S. co. of Iowa, drained by several creeks; area, 430 sq. m.; pop. in 1859, 8,377. The surface is diversified and occupied partly by prairies, and the soil is fertile. The productions in 1859 were 265,279 bushels of Indian corn, 9,608 of wheat, 8,508 tons of hay, 98,545 lbs. of butter, and 9,054 galls. of sorghum molasses. Capital, Albia.

MONROE, a city and the capital of Monroe co., Mich., 40 m. S. W. from Detroit, on the Detroit and Toledo railroad, and on each side of the Raisin river, 2 m. above its entrance into Lake Erie, with which it is connected by a ship canal; pop. in 1860, about 5,000. It is the E. terminus of the Michigan southern railroad, and the principal market for the staples of several of the southern counties. It contains a female seminary and collegiate institute, a union school and branches, a fine court house, 10 churches, and manufactories of woollen goods, leather, and flour. It was first settled by the French in 1776; but its settlement and improvement by the Americans began in 1835.

MONROE, JAMES, 5th president of the United States, born in Westmoreland co., Va., April 28, 1758, died in New York, July 4, 1831. His father was Spence Monroe, a planter, descended from Capt. Monroe, an officer in the army of Charles I., who emigrated with other cavaliers to Virginia in 1652. He was first sent to a classical school in Westmoreland, under the direction of the Rev. Mr. Campbell; and at the age of 16 or 17 to William and Mary college. His intention was to practise law, but important public events soon drew him toward another theatre of action. In 1776, at the age of 18, he left college and entered the army as a cadet. Soon afterward he received the commission of lieutenant in the company of Capt. William Washington, and took an active part in the campaign on the Hudson. He was present at the battles of Harlem heights and White Plains, and accompanied Gen. Washington in his retreat through New Jersey. In the attack on Trenton, perceiving that the enemy were endeavoring to erect a battery, to rake the American line, he advanced at the head of a small detachment, drove the artillerymen from their guns, and took possession of the pieces. On this occasion he received a ball in the shoulder, and was promoted to a captaincy. As aide-de-camp to Lord Stirling, with the rank of major, he

served in the campaigns of 1777 and 1778, and distinguished himself in the battles of Brandywine, Germantown, and Monmouth. At the first named battle, he was fighting by the side of Lafayette when the latter was wounded. By accepting the place of aid to Lord Stirling he lost his rank in the regular line, which he was desirous of regaining. This was however impossible, under the circumstances; and in order to retain him in the army, Gen. Washington, who had formed a high opinion of his abilities, recommended the legislature of Virginia to authorize the embodiment of a new regiment, and bestow the command upon Monroe. The regiment was authorized, and Monroe appointed colonel; but such was the exhausted condition of Virginia, consequent upon the large drafts previously made upon her by the general cause, that the enterprise was found impracticable. Finding his efforts useless, and all hopes of reentering the army as a commissioned officer at an end, Monroe determined to abandon military life, and return to the study of the law. This he proceeded to do, under the direction of Thomas Jefferson, then governor of the state. When the enemy, however, appeared soon afterward in Virginia, Monroe actively exerted himself in organizing the militia of the lower counties. The enemy, who had confined their attack to the seaboard, soon proceeded further southward, and Monroe's services were put in requisition by Gov. Jefferson, who sent him as military commissioner to the army in South Carolina. The surrender of Cornwallis took place soon afterward, and Monroe returned to peaceful pursuits. In 1782 he was elected to the assembly of Virginia from the county of King George, and in the same year was appointed by that body, although but 28 years of age, a member of the executive council. In 1788 he was chosen a delegate to congress for the term of 3 years, and took his seat on Dec. 18, just in time to be present at Annapolis and witness the surrender by Gen. Washington of his commission of commander-in-chief. Monroe fulfilled his duties in congress with zeal and efficiency. Becoming convinced that it was impossible to govern the country under the old articles of confederation, he advocated an extension of the powers of congress, and in 1785 moved to invest that body with authority to regulate trade between the states. The resolution was referred to a committee of which he was chairman, and a report was made in favor of the measure. This led to the convention at Annapolis, and the subsequent adoption of the federal constitution. Monroe also exerted himself in devising a system for the settlement of the public lands; and was appointed a member of the commission to decide upon the controversy between Massachusetts and New York, relating to their boundaries. Upon the question, which came up during his term, of a relinquishment of the right to navigate the Mississippi river, demanded by Spain, he sided with the southern states, and strongly oppos-

ed the policy of acceding to the demand. He was married about this time to Miss Kortright of New York, a lady celebrated for her beauty and accomplishments. She proved an exemplary wife, and an ornament to every society in which she appeared. Having served out his term, and being ineligible for the next 8 years, Monroe returned to Virginia, and established himself at Fredericksburg, with the view of practising law. In 1787, however, he was reelected to the general assembly, and in 1788 was chosen a delegate to the Virginia convention to decide upon the adoption of the federal constitution. He had opposed the old articles of confederation, and advocated an extension of the power of congress, as necessary for the good of the country; but the constitution framed by the convention of 1787 did not meet with his approbation. In common with Patrick Henry, George Mason, and other statesmen, he was apprehensive that the adoption of the instrument, without amendment, would confer too great an amount of power upon the general government. He therefore sided with its opponents, and strongly urged the policy of insisting upon previous amendments as the condition of its ratification by Virginia. "He could not conceive," he said, "that a conditional ratification would in the most remote degree endanger the Union, for that it was as clearly the interest of the adopting states to be united with Virginia, as it could be her interest to be in union with them." This policy was opposed by Madison, Pendleton, Marshall, and others; and the instrument was adopted by a vote of 89 to 79, with the proposed amendments simply recommended, Monroe voting in the negative. Although the federal party was in the ascendancy throughout the country, the course of the minority in the convention was fully approved by the great mass of the people of Virginia; and on the death of Mr. Grayson, one of the first senators under the constitution, Monroe was chosen in his place, and took his seat in 1790. He became a prominent representative in the senate of the anti-federal party, and acted with it throughout his term of office, which expired in 1794. In May of that year he received the appointment of minister plenipotentiary to France, to succeed Gouverneur Morris, who had been recalled at the request of the French government. He was received with enthusiastic demonstrations of respect, and publicly embraced by the president of the national convention. The flags of the two countries were intertwined, and Monroe presented the banner of America, receiving in return that of France. This marked exhibition of sympathy with the French republic was however regarded with extreme displeasure by the administration, as an impolitic departure from the neutral policy of the American government. John Jay had been sent to negotiate a treaty with England, and under these circumstances the course pursued by Monroe was considered injudicious and reprehensible, as tending to throw serious

obstacles in the way of the proposed negotiations. On the conclusion of the treaty, his alleged failure to present it in its true character to the French government excited anew the displeasure of the cabinet; and in Aug. 1796, he was recalled, under an informal censure of his official proceedings. On his return to America he published a "View of the Conduct of the Executive in the Foreign Affairs of the United States," in which he set forth the nature of his instructions and defended his action. This publication widened the breach between himself and the administration; but any feeling of personal animosity toward Washington or Jay subsequently subsided, and Monroe remained with both upon terms of warm regard. He did not appear again in public affairs until 1799. In that year, on the nomination of Madison, he was elected governor of Virginia, and filled the office for 3 years. On the expiration of his term in 1803, he was appointed by President Jefferson envoy extraordinary to the French government to negotiate, in conjunction with the resident minister, Mr. Livingston, for the purchase of Louisiana, or a right of depot for the United States on the Mississippi. Monroe was the confidential agent of Jefferson, intrusted with all his views in detail, and, it is said, carried with him verbal instructions to govern him in the proposed negotiation. The result exceeded the most sanguine expectations of the administration. Bonaparte needed money, and within a fortnight after the arrival of Monroe in Paris, the ministers secured for the comparatively trifling sum of \$15,000,000 the entire "territory of Orleans" and "district of Louisiana," thus adding to the United States an extent of country equal to the whole previous territory of the confederacy. Monroe is said to have always taken peculiar pride in the result of his efforts on this occasion, and to have regarded the part which he took in the acquisition of this vast tract as among the most important of his public services. In the same year 1803 he was commissioned minister plenipotentiary to England, as the successor of Mr. King, who had resigned, and exerted himself to conclude a convention for the protection of neutral rights, and against the impressment of seamen. In the midst of these negotiations he was directed to proceed to Madrid, as minister extraordinary and plenipotentiary, to adjust the controversy which had arisen between the United States and Spain in relation to the boundaries of the new purchase of Louisiana. In this he failed, and in 1806 was recalled to England to act with Mr. Pinkney, who had been recently appointed with instructions to negotiate a treaty for the protection of neutral rights. On the last day of that year a treaty was concluded, and soon afterward despatched to the United States. The ministers regarded it as advantageous, but the omission of any provision against the impressment of seamen, and its ambiguity in relation to the other great points of the rights of neutrals, rendered it strongly ob-

jectionable to the president, who refused to submit it to the senate, and sent it back to England for revision. All efforts to attain this failed, and Monroe returned to America. The course of the president in refusing to send the treaty to the senate had excited his strong displeasure, and other circumstances at the time tended to increase this sentiment toward Jefferson. The moment was approaching for the election of president, and a considerable body of the republican party had brought forward the name of Monroe as their candidate. The majority of the party, however, were in favor of Madison, and the preference of the president for him was well known. Monroe believed that the rejection of the treaty, and the preference expressed for his rival, indicated personal hostility on the part of Mr. Jefferson, and a correspondence upon the subject ensued, which proved honorable to both. Jefferson candidly, and with great kindness, explained his course, and showed that his preference for Madison was solely based upon solicitude for the success of the party, the great majority of which had declared in his favor. He further declared that he had not exerted himself in the matter, and should remain entirely neutral. The misunderstanding terminated, and Monroe withdrew his name from the canvass. In 1810 he was again elected to the general assembly of Virginia, and in 1811 chosen a second time governor of the commonwealth. Upon the resignation of Mr. Smith, in the same year, he was appointed by President Madison secretary of state. Gen. Armstrong having resigned the charge of the war department, after the capture of Washington, Monroe was appointed to discharge its duties, which he proceeded to do without abandoning the department of state. He found the treasury exhausted, the public credit at the lowest ebb, and the condition of the country such as would have driven a fearful spirit to despair. With his usual vigor, however, he set about the task of infusing order and efficiency into every portion of the departments under his charge, and proposed an increase of 40,000 men in the army, by levying recruits throughout the whole country. This unpopular measure he advocated without hesitation, although it was calculated to exert a fatal influence upon his prospects for the presidency. His attention was also urgently called to the defence of New Orleans; and finding the public credit completely prostrated, he pledged his private means as subsidiary to the credit of the government, and placed the city in a posture which enabled it to successfully oppose the forces of the enemy. Returning, on the conclusion of peace, to the department of state, he became the confidential adviser of President Madison in the series of measures for the reestablishment of public credit, and the regulation of the foreign relations of the United States. He continued to serve as secretary of state to the end of Madison's administration, in 1817. In that year he succeeded to the presidency,

as the candidate of his party, who were now generally known as democratic republicans, with Daniel D. Tompkins for vice-president. The new president's appointments were from the ranks of the party which had placed him in power, and his administration commenced under favorable auspices. Soon after his inauguration he determined to make a personal examination of the condition of the military posts in the North and East, and accordingly set out on May 31, 1817. Passing through Baltimore, Philadelphia, and New York, he visited in turn all the eastern states, and examined the public works with a critical eye. From Maine he proceeded westward through Vermont to the St. Lawrence, embarked for Lake Ontario, and terminated his explorations at Detroit, whence he returned through Ohio to Washington. During this extensive tour he thoroughly inspected arsenals, naval depots, fortifications, and garrisons; reviewed military companies, corrected public abuses, and studied the capabilities of the country, in view of future hostilities. The visit of the new president made him popular with the people, and he was met throughout his tour by civic processions, military escorts, and enthusiastic crowds. The costume which he adopted upon this occasion was calculated to render him popular with the old soldiers of the revolution, and all who remembered the struggle. It consisted of a blue military coat of homespun, light-colored underclothes, and a cocked hat—the undress uniform of officers in the revolutionary war. This suggestive dress, added to his plain and unassuming manner, conciliated the people, and the old cocked hat and blue coat no doubt reminded every one of the services of Col. Monroe in the contest for independence. The society of the Cincinnati at New York presented him with an address; and he referred, in the reply which he made, to the times of Washington, and his own former connection, on the battle field, with many of the persons whom he saw before him. In every point of view this journey was auspicious. Party lines seemed about to disappear, and the country to return to its long past state of union. The president was not backward in his assurances of a strong desire upon his part that such should be the case. In reply to an address of the people of Maine, he said: "The further I advance in my progress in the country, the more I perceive that we are all Americans; that we compose but one family; that our republican institutions will be supported and perpetuated by the united zeal and patriotism of all. Nothing could give me greater satisfaction than to behold a perfect union among ourselves—a union which is necessary to restore to social intercourse its former charms, and to render our happiness as a nation unmixed and complete. To promote this desirable result requires no compromise of principle, and I promise to give it my continued attention and my best endeavors." This assurance was honestly made, and honestly carried out.

He had not appointed a republican cabinet from violent partisan motives. He defended his course in a letter to Gen. Jackson on the ground that "decided friends who stand firm in the day of trial" should "be principally relied on," and that "the administration should rest strongly on the republican party;" but he was in favor of "indulging toward the other a spirit of moderation, and evincing a desire to discriminate between its members." He believed, he said, that "the great body of the federal party were republican," that no second party was necessary to the well-being of the government; and his aim was to bring about a peaceable ascendancy of the principles which he represented. The course of the administration was in conformity with the assurances of the president on his tour, and conciliated the support of an overwhelming majority of the nation. Distinctions of party seemed scarcely any longer to exist, and republicans and federalists coalesced in support of the government. Mr. Clay was reelected speaker of the house, and the great body of recommendations in the president's message were approved by large majorities. The tone of debate was far more moderate; few of the bitter criminations which had been the fashion in the past were uttered; and those "former charms of social intercourse," referred to by the president, seemed about to be permanently restored. Among the important public events of the first term of President Monroe, were the admission into the Union of the states of Mississippi, Illinois, and Maine. At the first session of congress, an animated discussion of the constitutionality of internal improvements by the general government took place, and at one stage of the bill a majority of 15 appeared in the house in favor of using the public funds for the construction of canals, and for military and post roads. The subject was however postponed for the time. Other questions of importance were the policy of recognizing the independence of the South American colonies, and of approving the course of Gen. Jackson, who, having been sent against the Seminole Indians in Alabama, had pursued them into the Spanish possessions in Florida, seized the fortified towns of St. Mark's and Pensacola, and taken possession of the country in the name of the United States. On the first named measure Mr. Clay spoke with great eloquence, but the proposition was rejected by a large majority, though subsequent events vindicated the views of Clay. Gen. Jackson's course was strongly disapproved, as an unwarranted invasion of the territory of a power with which the United States were at peace; and the forts which had been seized upon were ordered to be restored to the Spanish authorities. A strong party, however, supported Jackson; and when, at the subsequent session of congress, a vote of censure upon his conduct was moved, it was rejected by a large majority. In 1818 a convention was concluded between Great Britain and the United States in relation

to the Newfoundland fisheries, the restoration of slaves, and other subjects; and in 1819 Spain ceded to the confederacy her possessions in East and West Florida, with the adjacent islands. In this year the country was first divided into two great parties upon a geographical line, and the debates in congress became angry and embittered. The occasion of this discussion was the bill authorizing the people of the territory of Missouri to form a constitution and state government, for admission into the Union. It was moved to amend the bill by the insertion of a clause imposing it as a condition of admission that the constitution of the new state should contain a prohibition of the extension of slavery within her limits; and upon this the debate took place. The restrictive amendment was rejected, and the bill passed the house with the proviso attached, "that in all the territory ceded by France to the United States under the name of Louisiana, which lies north of thirty-six degrees and thirty minutes north latitude, not included within the limits of the state contemplated by this act, slavery and involuntary servitude, otherwise than in the punishment of crimes whereof the parties shall have been duly convicted, shall be and is hereby for ever prohibited: provided always, that any person escaping into the same, from whom labor or service is lawfully claimed in any state or territory of the United States, such fugitive may be lawfully reclaimed and conveyed to the person claiming his or her labor or service, as aforesaid." The bill passed the senate and was approved by the president, March 6, 1820. The presidential election coming on in this year, Monroe and Tompkins were again nominated and reelected; the former by a vote of 281 out of 283, the latter by a vote of 218. The Missouri agitation was renewed on the question whether her votes for president and vice-president should be counted, but finally terminated with the adoption of a resolution reported by Mr. Clay from the joint committee upon the subject. This resolution provided that Missouri should be admitted "on an equal footing with the original states, in all respects whatever," on condition that the clause contained in her constitution prohibiting the emigration of free negroes into the state should never be construed so as to authorize the passage of any law by which "any citizen of either of the states in this Union should be excluded from the enjoyment of any of the privileges and immunities to which such citizen is entitled under the constitution of the United States." On Aug. 10, 1821, Missouri accordingly became one of the states of the Union. Other events of public importance during the administration of President Monroe were his approval of an act appropriating the sum of \$30,000 for the survey of routes for canals and public roads, by which he gave his sanction to the internal improvement doctrine; the recognition in 1822 of the independence of Mexico, and the provinces in South America formerly under the dominion

of Spain; and the promulgation, in his message of Dec. 2, 1823, of the policy of neither entangling ourselves in the broils of Europe, nor suffering the powers of the old world to interfere with the affairs of the new, now generally known as the "Monroe doctrine." On this occasion the president declared that any attempt on the part of the European powers to "extend their system to any portion of this hemisphere" would be regarded by the United States as "dangerous to our peace and safety," and would accordingly be opposed; a platform of principle upon this important subject which has been approved by the prominent statesmen of the country from the time of its proclamation to the present. The year 1824, the last of Monroe's administration, was signalized by the visit to the United States of the venerable Lafayette, who was received throughout the Union with enthusiastic exhibitions of public affection and respect. On March 8, 1825, Monroe retired from office, and returned to his residence of Oak Hill, in Loudoun co., Va. He was still, however, to serve the public in a useful, if humbler capacity. He was chosen a justice of the peace, and as such sat in the county court; he was also elected one of the board of visitors of the university of Virginia, and displayed great interest in its affairs. In 1829 he became a member of the Virginia convention to revise the old constitution, and was chosen to preside over the deliberations of that body, which he did with great efficiency and dignity. He was compelled, however, by ill health, to resign his post in the convention, and to return to Oak Hill. Pecuniary embarrassment was added to bodily infirmity; and although he had received \$350,000 for his public services, he was in his old age harassed by debt. Under these circumstances he removed in the summer of 1830 to the residence of his son-in-law, Mr. Samuel L. Gouverneur, in the city of New York, where the warmest filial tenderness soothed his latter days. Here he died, like his predecessors Adams and Jefferson, on the anniversary of the declaration of independence. In 1858 his remains were removed with great pomp to Richmond, Va., and reinterred on July 5 in the Hollywood cemetery.—Although not a man of brilliant endowments, Monroe performed an amount of public service which entitled him to the respect and thanks of the country. He held the reins of government at an important period, and administered the affairs of the confederacy with prudence, discretion, and a single eye to the general welfare. He went further than either of his two great predecessors in developing the resources of the country; and although the measures of his administration were not wholly acceptable to the strict republicans of the state rights school of politics, they were approved by the great body of the people, and secured for the president extended favor. The policy which he adopted resembled in important particulars that of the old federal party under Washington, and

conciliated to his support many of the most prominent men of that body. He encouraged the army, increased the navy, augmented the national defenses, protected commerce, and infused vigor and efficiency into every department of the public service. His efforts to advance the interests and heighten the general prosperity of the whole nation were energetic and unceasing. On the great question of intervention by the European powers in the affairs of the western continent, he assumed a bold and uncompromising position, which was supported by the people, and has ever since operated as a check upon the governments of the old world. Other features of Monroe's administration have been noticed, to which may be added his approval of the bank of the United States. In relation to internal improvements by the general government, there was long continued hesitation on the part of the president and his cabinet; but the doctrine was eventually sanctioned in the last hours of his administration. When he retired from the presidency he left the country in a high state of prosperity, and carried with him the general respect and regard of the nation. He was well calculated personally to call forth these sentiments from men of all parties. His honesty, good faith, and simplicity were acknowledged by his contemporaries with scarcely an exception, and disarmed the political rancor of his strongest opponents. His friends were devotedly attached to him, and left numerous testimonials of their admiration of his manly integrity and truth of character. Jefferson said that "if his soul was turned inside out, not a spot would be found on it;" and Madison was his warm admirer. "Few men," said Madison, "have ever made more of what may be called sacrifices in the service of the public. When he considered the interests or the dignity of his country involved, his own interest was never regarded. Beside this cause, his extreme generosity, not only to the numerous members of his family dependent on him, but to friends not united by blood, has greatly contributed to his impoverishment." It was the opinion of Madison that the country had never fully appreciated the strong robust understanding of Monroe. The fact may be partially accounted for by his deficiency in the power of public speaking. He never acquired distinction in oratory, a showy talent which in America so largely influences the popular judgment in regard to intellectual endowments. His eminence lay rather in the capacity of administering important affairs with judgment, energy, and laborious industry. These talents he exhibited in a marked degree, and they enabled him to perform his executive functions with an efficiency which has proved of lasting benefit to the country. In person, Monroe was tall and well formed, with a light complexion and blue eyes. The expression of his countenance was an accurate index of the simplicity, benevolence, and integrity of his character. He was plain in his

manners and tastes, fond of the society of his friends, strongly "given to hospitality," and a very fair specimen of the kindly old race of Virginia country gentlemen.

MONROVIA, a seaport town on the W. coast of Africa, capital of the republic of Liberia, in lat. $6^{\circ} 18' N.$, long. $10^{\circ} 50' W.$; pop. about 2,000. It is built on the left bank of the Mesurado river, near its mouth, close to Cape Mesurado. Its appearance from the sea is picturesque; there are several well built stone houses, among which the legislative hall is conspicuous from its size. A stone fort occupies the highest ground in the place, and there are several churches and schools. An academy is supported by voluntary contributions, and there are 2 weekly newspapers. (See LIBERIA.)

MONS (Germ. and Flem. *Bergen*), a fortified city of Belgium, capital of the province of Hainault, on the river Trouille, 38 m. by railway from Brussels; pop. 25,000. It communicates with the Scheldt by the canal of Mons, and a branch railway between Mons and Manage opens a direct communication from Paris to Namur and Cologne. The E. side is protected by 2 large ponds, and the defensive capabilities are increased by the facilities for laying the surrounding country under water by admitting the river Trouille. The walls are in the form of a polygon, have 5 gates, and are flanked by 14 bastions. The principal church is that of St. Wandru (Waltrudes), a fine Gothic edifice. Among other principal public buildings are the castle, the Gothic town hall, court house, college, theatre, arsenal, and military hospital. There are several salt and sugar refineries. In the vicinity there are nearly 400 coal pits which give employment to over 26,000 persons. The coal basin in which the city is situated is called the Borinage, and the miners Borains. In coal, flax, hemp, grain, timber, horses, cattle, and manufactured goods, a very active trade is carried on. The number of public schools in 1858 was 181, and of scholars in the royal atheneum 289. Mons is supposed to occupy the site of the Roman station which Quintus Cicero defended against the Nervii during the Gallic war.

MONSEIGNEUR (Fr. *mon*, my, and *seigneur*, lord), a French title once common to saints, and subsequently applied to princes, nobles, certain high dignitaries of the church, and other titled personages. Under the monarchy the dauphin's eldest son was styled *Monsieur*, without any addition. In France the title is now given only to prelates, French princes, and princes of the imperial family. The Italian *monsignore* has a signification similar to that once given to *monseigneur*.

MONSERRAT. See MONTSEERAT.

MONSIEUR (Fr. *mon*, my, and *sieur*, sir), a French title of gentlemen, corresponding in its original signification and use to the female title *madame*. Under the monarchy it was applied without the addition of the name to the king's eldest brother. It is now given indifferently to Frenchmen of every rank and condition. Dur-

ing the first revolution, and for brief periods in 1830 and 1848, *monseigneur* was replaced in general use and in public documents by *citoyen*, citizen. As long ago as the time of Shakespeare the term was applied in a contemptuous sense to Frenchmen by English writers.

MONSOON (Arab. *musim*, season, corrupted by the Portuguese into *mucão*), an intertropical wind which blows part of the year from one point of the compass, and the remainder of the year in a contrary direction. Though occurring in other parts of the tropical world, these winds are more particularly known in the seas adjoining the great Asiatic continent and archipelago, including New Guinea and the N. part of Australia, whence they extend to about long. $160^{\circ} E.$ The natural causes which produce these currents of air are, in theory, the same as those generally supposed to cause the trade winds. When the sun is in N. latitude and comes over a large portion of Arabia, Hindostan, Burmah, and Cochin China, and these lands become heated to a much higher temperature than the surrounding equatorial sea and atmosphere, the cooler air flows toward these regions; and as they have less rotatory velocity than the latitudes bordering upon the equator whence the current comes, it acquires a relative S. W. direction in passing to the N. and is called the S. W. monsoon. In the northern hemisphere, when the land is cooled by the sun being in S. latitude, the regular N. E. trade wind prevails throughout these seas, and what is called the N. E. monsoon is in reality the N. E. trade wind. South of the equator the S. E. trade wind continues to blow over all that part of the ocean that has not large tracts of land to the S.; but where this is the case, as in the Java seas, and as far E. as New Ireland, where the great Australian continent lies to the S., we find the same causes operating again, and a N. W. monsoon taking the place of the regular S. E. trade wind when the sun has southern declination. These general laws, with trifling exceptions, apply to all monsoons; that is to say, when the S. W. monsoon blows N. of the equator, it blows from the S. E. to the S. of the equator; and when it blows from the N. W. in S. latitude, it blows from the N. E. in N. latitude.

MONSTER, a term limited by Laidore Geoffroy St. Hilaire to the complex and grave congenital anomalies of conformation, disagreeable to the sight, rendering difficult or impossible the accomplishment of certain functions, and producing a disposition of organs very different from that ordinarily presented by the species, whether animal or vegetable—involving change in the form, structure, volume, position, and number of parts. This definition greatly simplifies the subject to be treated here, as it excludes simple vices of conformation, such as hare lip, club foot, fissured palate, gigantic and dwarfed stature, albinism, abnormal number of fingers and toes, unusual origin and insertion of muscles, vessels, and nerves; the symmetrical transposition of organs from the normal side of

the body to the opposite (as sometimes occurs in man without serious disturbance of the functions), the general inversion seen in gasteropod mollusks like snails, and the unsymmetrical formation of the flatfish family; it also excludes the varied cases of hermaphroditism. The phenomena of monstrosity were discussed by Hippocrates, Aristotle, Pliny, Galen, and others; but with all the facts collected and the ingenious theories promulgated, they were not examined in a philosophical spirit until the 19th century, when the sciences of comparative anatomy and embryology could be brought to their explanation; the principal workers in the field at this period were the elder Geoffroy St. Hilaire, Serres, and Meckel. The history of monsters, or teratology, is not a mere branch of pathological anatomy, nor of physiology, nor of embryology, nor of philosophical anatomy; it has intimate relations with all these, but must not be confounded with any; it is a science in itself, with its special facts, general laws, and medical and zoological applications. In the fabulous period of this science, ending about the beginning of the 18th century, monsters were regarded as exhibitions of the creative power of God, as proofs of his anger and the signs of some approaching public calamity, or as the work of demons; and as such, by the old Greek and Roman laws, they were at once put to death; even as late as the 17th century they were either destroyed or shut up from human sight. In the first half of the 18th century, when superstition and prejudice began to disappear, the causes of monstrosity were zealously sought for, and from the time of Haller the science made rapid progress; philosophical anatomy, with its proof of the unity of organic composition, and embryology with its facts of arrested development, led to important advances, and introduced order into the previous chaos. Many forms of monstrosity are embryonic conditions rendered permanent beyond the normal period, thus forming a series comparable to the ages of the fetus and to zoological divisions of animals; others seem to be formed by excess of growth, according to the theories of original excess of productive power or of eccentric development of the vascular system; double monsters, whether partial or complete, are united by homologous surfaces, side to side, back to back, or face to face, each internal organ of one having a corresponding organ in the other; and the laws regulating monstrosities, whether by excess or defect, are intimately connected with those presiding over normal organizations. Is. Geoffroy St. Hilaire (*Histoire des anomalies, &c.*, 3 vols. 8vo., Paris, 1832-'6) makes the 2 classes of single and compound monsters, which he divides into orders, tribes, families, and genera on the Linnæan zoological plan; in the 1st class he places all such as have the elements of only a single individual, and in the 2d those which have the parts, complete or incomplete, of 2 or more individuals; for details the reader is referred to the work itself, as only an outline of the divi-

sions can be given here. In the first class he makes 3 orders: A. *Autosites*, or such as are capable of sustaining life, sometimes extra-uterine, by their own organs, having a heart, lungs, almost all the digestive organs, and a portion at least of the head, most of the body remaining symmetrical and nearly normal. This order contains 4 subdivisions or tribes: I., in which the limbs are modified by deficient development or by fusion, or are absent; II., in which the viscera of the trunk are more or less seriously displaced and external, the limbs more or less normal, incapable of extra-uterine life; III., in which the principal anomalies are in the cranium and brain, the modifications of the face and limbs being of secondary importance; the brain is deformed, incomplete, partially or wholly outside the cranial cavity, or even entirely absent, with corresponding deficiency in the arch of the skull; this includes an extensive series both in man and animals, among others the so called anencephalous fetuses, all incapable of life beyond a few hours or perhaps days; in some the spinal canal is largely open, and the spinal cord as well as the brain absent; IV., in which the face is more deformed than the cranium, the nasal apparatus being atrophied or displaced, bringing the eyes more or less near together, or the central region of the face so deficient that the ears are joined on the median line; this includes the one-eyed monsters, like the fabulous Polyphemus (see *Cyclopsism*), and rhinencephalous fetuses; all these die speedily from the imperfection of the brain. B. The *omphalotes*, living a merely vegetative life ceasing with the separation from the parent, have many of the organs wanting and the existing ones very imperfect, with abnormal and unsymmetrical forms; these include the parencephalous and acephalous fetuses, the former having some traces of cranium, but no heart sufficient to circulate blood, and the latter destitute of head except the merest rudiments, often having neither neck nor chest, and but few of the abdominal organs; they never reach the full term of gestation. C. The *parasites* include the imperfect products of conception commonly called moles; they are irregular in form, composed principally of bones, teeth, hairs, and fat, having no umbilical cord, and implanted directly on the parent organs, where they live a vegetative and parasitic life; in most cases these appear to be a deformed and abnormally developed placenta, with a few remains of the prematurely dead embryo; they have been found attached to the uterus and the ovaries, and the gestation has usually been much prolonged, even to years, some of the 2d teeth having been seen in their substance. In the 2d class, or that of compound monsters, the double ones he divides into *autositaires*, in which the 2 individuals present the same degree of development, each having an equal share in the life common to both, a union of 2 *autosites*; and *parasitaires*, composed of 2 very unequal or dissimilar individuals, one complete and the other imperfect,

and the latter capable of living only at the expense of the former. The tribes of the *autotestes* are: I. That in which the individuals are united only in a single region, the duplicity being complete in every other part. This tribe is naturally subdivided into 2 families, according as the umbilicus is double or single; in the former belong the double monsters united by any portion of the trunk or head, like the famous Hungarian sisters, Helen and Judith, joined back to back by the thighs and loins; these were born in 1701, and lived to their 22d year; they had neither the same temperament nor character, and Helen was larger, better looking, more active, intelligent, and gentle than her sister; they were very fond of each other, performed some physiological acts in common and others separately, and were sick and died together. Two black children, united back to back, were exhibited in the United States a few years since. Many interesting psychological, physiological, and pathological questions are connected with such monstrosities, for details of which the reader may consult the authors quoted by Geoffroy St. Hilaire. To the family with a single umbilicus belong such as are joined in the hypogastric and sternal regions, front and sides of thorax, and sometimes even by the neck and jaws. Among those united by the xiphoid region of the sternum are the Siamese twin brothers, Chang and Eng, having a single umbilicus in the centre of the moderate-sized connecting process; they were born in 1811, have been exhibited in most parts of Europe and the United States, and are now residents here, each being married and having a family of children; their respiration and circulation are said to be generally synchronous in the calm state, and their hours of sleep and waking, their joys and sorrows, anger and pain, ideas and desires, to be the same; they realize the idea of perfect friendship, the two being one and each one two in thought and act, and the inevitable confidants of each other; a description and figure may be found in Silliman's "Journal" for 1830. Though these have lived to the age of about 50 years, in the last named members of the group the anomaly is generally incompatible with extra-uterine life. Tribe II. comprises monsters in which the individuals are distinct at the pelvic extremity, but more or less intimately connected in the head and sometimes in the whole supra-umbilical region. In one family the bodies are united from the umbilicus upward, with the head more or less completely double, in some with the 2 faces directly opposite like the Janus of mythology; as far as known, this deformity is incompatible with life. In another family the trunks are joined above the umbilicus, with a single head bearing but few marks of duplicity, and with 2 or 4 thoracic limbs; both these families occur in man, but the latter very rarely. Tribe III. includes, on the contrary, such as have the head double, but the trunks more or less united into a single body and 2 lower extremities; sometimes the

bodies are distinct from the umbilicus upward, with generally a rudimentary 3d lower limb; in others the heads are united behind, but show 2 faces in front. In the *parasitaires* the smaller and less perfect individual may be attached near the umbilicus, or very far from it, and may be reduced to a mere head without body; in some cases the monster seems a single body, with supernumerary jaws, portions of the head or extremities; and in the least perfect of all the accessory growth is included within the principal body. The parasitic growth, from its small size, does not interfere with the birth, and such monsters have not only lived to be adults, but have become parents of well formed offspring. Most authors deny the existence of triple monsters, but Geoffroy St. Hilaire admits it, regarding the quadruple and quintuple cases as equally fabulous with the many-headed Lernean hydra. Under the class of fabulous monsters it will be sufficient to allude to the Minotaur, the centaurs, satyrs, dragons, tritons, sirens, and mermaids of the ancient mythology; to the hideous forms made to represent demons and gods in the pagan schemes of theology; and to such other zoological impossibilities, as creatures half human half animal, still admitted by the ignorant and credulous.—Considering the whole number of births, monstrosities are rare; after man they are most common in the hog, ox, cat, sheep, dog, and chick. Many, if not most, monsters give no indication of anomaly in the course of gestation, and are usually born of mothers in good health and who have previously had normal children; females which bring forth twins have been found most liable to produce monsters, the separate amnios of each from contiguity favoring the confusion or blending of parts; the birth is usually premature, though sometimes long after the natural time; the hereditary transmission of monstrosity is very rare, even when the reproductive functions are unimpaired; the female sex seems to predominate, taking the whole range of monsters. Monstrosity is more common and extraordinary in the vegetable than in the animal kingdom, from the easier derangement and displacement of parts; yet even here it is subject to and explicable by the laws of normal vegetable growth; some botanists consider double flowers and other similar products arising from peculiar culture as monsters, and such as these are perpetuated by seed. Monstrosity may be due to an absence of formation; to an arrest of development, an embryonic structure remaining permanent; to an excess of development; and to a union of parts, more or less normal, belonging to different individuals. Though it is impossible to admit the action of slight causes, of momentary continuance, popularly believed to be connected with monstrous or imitative growths, still the artificial production of variously deformed and imperfect chicks by the shaking, or malposition, or unnatural treatment of eggs, shows that appreciable external causes may occasionally be satisfactorily traced; it is

now generally conceded that long continued unfavorable circumstances acting during pregnancy may lead to monstrous growths. See the numerous works quoted by Geoffroy St. Hilaire, and especially the memoirs of Lemery in the *Histoire de l'Académie des sciences de Paris*, 1788 and 1789.

MONSTRELET, ENGUEERAND DE, a French chronicler, born in Cambrai about 1890, died in 1458. Few of the events of his life are known. Throughout his chronicle he never makes the slightest allusion to himself save once, and then he tells us that he was present at the interview between the maid of Orleans and the duke of Burgundy, after the capture of that heroine. He appears to have been well educated, and probably took no part in warlike pursuits. He filled several offices in Cambrai, being bailiff of the chapter, provost of the city, and bailiff of Wallaincourt. His chronicle is in 2 books, extends from 1400 to 1444, and comprises an account of the capture of Paris and the conquest of the French monarchy by Henry V., and of the wars which resulted in the expulsion of the English from every portion of France except Calais. His style has none of the animation and picturesqueness of Froissart, but it is marked by dignity, simplicity, and accuracy. The best edition of Monstrelet's chronicle is that of Buchon (15 vols. 8vo., Paris, 1836). The best English version is that by the Rev. Thomas Johnes (18 vols. 8vo., London, 1810). Appended to the earlier editions of Monstrelet are two spurious books continuing the history to 1467.

MONT BLANC (Fr., "white mountain," so called from the snow which covers it), the highest of the Alps and the highest mountain in Europe, is in Savoy, France, in lat. 45° 50' N., long. 6° 52' E. It extends in length about 18 m. from N. E. to S. W., with a breadth of 5 to 6 m. Its highest elevation, which is but a narrow pinnacle, is 15,775 feet above the level of the sea; and its summit for a distance of 7,000 feet down either side is clothed with perpetual snow. It presents the most magnificent appearance when seen from the north, from the vale of Chamouni, whence it seems to rise into the sky like a dome high above all neighboring peaks. From the southern point of view, from the vale of Aosta, its aspect is wilder and darker with more irregular outlines. The higher parts of Mont Blanc are composed of primitive rock formed in parallel strata in a vertical direction; and its outlying flanks consist of calcareous strata turned up against the great central mass. The sides, to the height of 8,000 to 4,000 feet above Chamouni, are skirted with forests, the more elevated of which contain nothing less hardy than pines and larches. The surface of its higher parts is diversified and very irregular; there are numerous jutting rocks, called *aiguilles* or needles; large fields of ice, often broken into fissures of unknown depth; and grottoes excavated beneath the masses of ice by the warmer temperature below, and hanging with splendid stalactitic formations. Glaciers

frequently sweep down its sides. The beauty of Mont Blanc as it appears in the evening is the wonder of every traveller, and has often been described. Its summit shines with a faint light, almost as if it were one of the heavenly bodies, or as if it had some mysterious principle of light within itself. The phenomenon is thus accounted for: there is high in the atmosphere a zone of thin vapor which is still lighted by the sun after Mont Blanc has ceased to be within range of its rays, and this vapor reflects a part of the light which it receives upon the summit of the mountain. The first ascent of Mont Blanc was made with great danger and difficulty by Dr. Paccard and Jacques Balmat in Aug. 1786; but during the preceding 10 years several unsuccessful attempts had been made. They found the cold so excessive that they remained on the summit only half an hour. The next year De Saussure accomplished the ascent, and made a variety of scientific observations.—See "The Story of Mont Blanc" (London, 1854), by Albert Smith, whose ascent in 1851 and subsequent pictorial and dramatic descriptive entertainment gave unusual popularity to the subject in England for several years. Many ascents are now made every season; a record of two (1858-'9) by Prof. Tyndale is in "The Glaciers of the Alps" (London, 1860). The achievement has lost much of its terrors.

MONT DE PIÉTÉ, the name of a public institution in continental Europe, the original object of which was to deliver the needy from the onerous charges to which they were subjected by Jewish and Lombard money lenders. A Bavarian writer claims the origin of such institutions for the town of Freisingen, where one is said to have been founded in the 12th century under the auspices of a charitable association and with the sanction of Pope Innocent III. It is more generally believed, however, that the first mont de piété was established in Perugia, in the latter half of the 15th century, at the instigation of the pious Father Barnabas of Terni, and that it derived its name (*monte di pietà*) from the hill upon which it was situated. St. Bernard of Feltre founded a similar institution at Mantua, and St. Charles Borromeo prepared the charter for that of Rome. The popes Leo X. and Paul III. issued bulls to express their approbation of these institutions, which were soon established at Padua and in other parts of Italy. The name of Sixtus V. is associated with the formation of that of Savona. They were introduced into the Netherlands by Wenzel Coeberger, an artist, during the latter part of the 15th century. The earliest one in France was probably that of Rheims. Marseilles, Montpellier, and other French cities possessed monts de piété toward the middle of the 17th century; as in Italy, they were supported by charitable endowments, but they charged interest at the rate of 15 per cent. upon all loans exceeding 5 francs, whereas the Italian institutions only charged a small rate, rarely exceeding 5 per cent, to cover the indispensable

expenses. The mont de piété of Paris was opened Jan. 1, 1778, and was authorized in 1779 to make a loan guaranteed by the income of the *hôpital général*. During the revolution it was closed; and the usurious rates of interest charged by the money lenders during the reign of terror caused its reopening in 1808 to be hailed with delight by the poor of Paris. In 1831 it was placed under the charge of an administrative council, the president of which was the prefect of the department of the Seine. In 1851 the monts de piété were placed under the superintendence of a select committee (*conseil de surveillance*), and were entirely separated from that of the hospitals, with which they had been previously connected. Their income is derived from the surplus funds of other charitable institutions; from the security money deposited in the French treasury by government employees; from the contributions of shareholders; and from loans which the monts de piété are authorized to contract, by issuing bills at 12 months payable to bearer, at the current rate of interest. The Paris mont de piété is situated in the rue des Blancs Manteaux and rue de Paradis, with a branch in the rue Bonaparte, and auxiliary offices in the rue de la Pepinière and de la Montagne Ste. Geneviève. There are also about 20 agents scattered over Paris, appointed by the administration, who are largely employed in the business of loans, but whose onerous charges give rise to considerable complaint. The mont de piété makes advances from 8 francs upward at a rate fixed in 1854 at 4½ per cent. per annum, which may be raised to 5 per cent. whenever the reserve fund deposited in the public treasury is less than 1,200,000 francs (\$400,000), beside which ½ per cent. per month is deducted for the expenses of the establishment; one ninth of these charges is payable in advance. There is also a charge of ¼ per cent. upon the amount of the loan. No money is advanced except upon securities, the value of which is assessed by a committee of 12 appraisers, ½ of the value being advanced upon articles of gold and silver, and ¾ upon all other articles. The articles pledged are sold at public sales at the expiration of a year, unless redeemed (the repayment being accepted in instalments as low as 1 franc) or renewed for another year, with the exception of certain perishable articles, upon which loans cannot be renewed. A receipt is issued for the article pledged, and made out to bearer. The sale of such receipts gives rise to much abuse, which the government has hitherto been unable to check, although a law was passed in 1851 which permits the depositor to demand the sale of his pledges, at the regular period of the public sales, 3 months after their deposit, and accordingly 9 months before the expiration of the loan. The annual receipts and expenditures of the mont de piété are respectively about 40,000,000 francs, with a balance of about 50,000 francs in favor of the institution. The most profitable customers of the mont de piété are not the poor, but the needy of

the higher classes, nearly 400,000 out of 1,200,000 articles deposited annually consisting of jewelry and articles of luxury, the value of which forms ¾ of the total amount advanced. On an average there are about 700,000 articles on hand at the mont de piété, valued at 14,000,000 francs. The daily number of loans made and redeemed is about 4,000, except on Saturdays, when the number redeemed is 5,000 to 6,000, and on the eve of New Year's day and Easter it rises to nearly 10,000. In 1857 the advances amounted to 85,458,914 francs, of which about 8,000,000 was for renewed loans, and the rest new loans upon 1,887,008 articles.—There are in France about 50 monts de piété, and upward of 100 in Holland, not including the small public loan banks in that country, where articles are deposited for the shortest period against the most trifling advances, but at the risk of incurring exorbitant charges, the great number of such offices constituting one of the most remarkable features in the Jewish quarters of Amsterdam. There are upward of 20 monts de piété in Belgium. The principal cities of Germany possess similar institutions, the best managed German mont de piété being in Hamburg. The rate of interest in Germany varies from 8 to 12 per cent.; loans rarely exceed the amount of \$150, and the smallest pledge must be worth at least about \$2, one month being the shortest and a year the longest term of the loan. The rate of interest in the Russian monts de piété is 6 per cent. China is said to possess very ancient institutions of the kind, under the direction of great public dignitaries, which seem to be conducted upon more charitable principles than those of Europe, the rate of interest there being only from 2 to 3 per cent. England and the United States possess no public institutions like the monts de piété, the pawnbrokers' offices in these countries being private establishments.

MONTAGU, BASIL, an English lawyer and author, born in London, April 24, 1770, died in Boulogne, Nov. 27, 1851. He was a natural son of John Montagu, 4th earl of Sandwich, and Miss Ray, who was shot in 1779 at Covent Garden by the Rev. Mr. Hackman, a frantic admirer. Basil was graduated at Cambridge, and after studying at Gray's Inn was called to the bar in 1798. He never attained eminence as a pleader, but acquired a large practice in cases of bankruptcy, to which he principally devoted his attention. He formed an intimacy with that literary circle of which Coleridge was a leader, and became a convert to the political theories of Godwin, under whose influence he meditated abandoning his profession as injurious to society, but was dissuaded from doing so by Sir James Mackintosh. In 1806 Lord Chancellor Erskine made him a commissioner of bankrupts, his experience in which office so impressed him with the evils of the law administered in his court that, by publishing a yearly detail of its pernicious results, and giving evidence against it before a committee of the house of commons, he ultimately induced its amelioration.

Under the new law Mr. Montagu was appointed accountant-general, in which capacity he compelled the bank of England to pay interest (never previously demanded) on the moneys that had been deposited there by his court, and thus recovered about £20,000 for the bankrupt fund. He also distinguished himself by his exertions for the abolition of capital punishment, in advocacy of which he published several works. He was a very voluminous author and editor, having published 40 volumes, and left behind him, it is said, 100 volumes in manuscript. His principal professional work is "A Digest of the Bankrupt Laws" (4 vols. 8vo., London, 1805). Of his editorial works the most important is his edition of "The Works of Francis Bacon, Lord Chancellor of England" (16 vols. 8vo., London, 1825-'84), the last volume of which contains a "Life of Bacon" by the editor.

MONTAGU, EDWARD WORTLEY, an English miscellaneous author, born in Wharfedale, Yorkshire, in 1718, died at Lyons in 1776. He was the only son of Edward Wortley and Lady Mary Wortley Montagu. He ran away from Westminster school, and hired himself as a cabin boy on board a ship bound for Spain, whence after some time he was restored to his friends in England by the British consul at Cadiz. He was next committed to the charge of a private tutor, and sent to travel on the continent. On returning to England he married a woman in very humble life, almost old enough to be his mother, lived with her a few weeks, and then abandoned her. In 1747 he was returned to parliament by the county of Huntingdon, but soon became so involved in debt in consequence of his extravagant habits, that he had to resign his seat and withdraw to France. From France he proceeded to Italy, where he became a convert to the Roman Catholic church; and from Italy to Egypt, where he turned Mohammedan, and is said to have espoused another man's wife. He was disinherited by his father, who ever regarded him with marked aversion. He was returning to England when he died. He wrote "Reflections on the Rise and Fall of the Ancient Republics," and "An Examination into the Causes of Earthquakes," and contributed some papers to the "Philosophical Transactions."

MONTAGU, ELIZABETH, an English authoress, born in York in 1720, died Aug. 25, 1802. She was the daughter of a Mr. Robinson of Horton in Kent, and a pupil of Dr. Conyers Middleton. In 1742 she married Edward Montagu, a grandson of the first earl of Sandwich, who died in 1775, leaving her a large fortune. She made her house a favorite resort for literary characters, and one of the principal places of meeting of the blue stocking club. Dr. Johnson was frequently one of her guests. For many years she gave annual dinners on May day to the chimney sweeps of London. She was the author of 8 "Dialogues of the Dead," published with Lord Lyttelton's (1760), and wrote an "Essay on the Genius and Writ-

ings of Shakespeare" (1799), in refutation of the criticisms of Voltaire. After her death 4 volumes of her epistolary correspondence were published by her nephew, Matthew Montagu.

MONTAGU, LADY MARY WORTLEY, an English authoress, eldest daughter of Evelyn Pierrepont, duke of Kingston, and Lady Mary Fielding, daughter of the earl of Denbigh, born in Thoresby, Nottinghamshire, in 1690, died Aug. 21, 1762. She was related through her father to Beaumont the dramatist, and through her mother to Fielding the novelist, who was her second cousin. She was but 4 years old when her mother died. Her beauty and wit made her the pet of her father, and she acquired the elements of the Greek, Latin, and French languages under the tuition of her brother's preceptors. At the age of 8 years she passed what she deemed the happiest day of her life in the Kit-Cat club, consisting of some of the most eminent men in England, into which she had been elected in a frolic; at 12 she wrote a poetical epistle from Julia to Ovid; at 15 she was meditating the establishment of an English nunnery, and was correcting her education, which she calls "one of the worst in the world," by extensive reading both of works of learning and fancy; and at 20 she made a translation of the *Enchiridion* of Epictetus, probably from a Latin version. Meantime she had lived principally at Thoresby and at Acton, near London, and as the eldest daughter of a widower was wont to preside at the dinner table and to exert her social powers in the entertainment of guests. In 1712 she was privately married to Edward Wortley Montagu, Esq., a country gentleman who had received a classical education, had travelled on the continent, and was intimate with Addison, Steele, Garth, and Congreve. A disagreement concerning the settlements had caused the duke of Kingston to withhold his consent, and the union did not prove a happy one. They lived in the country till after the accession of George I. in 1714, when Mr. Montagu joined the ministry as one of the lords of the treasury. Lady Mary, on her first appearance at St. James's, was hailed with universal admiration, as much for the unrivalled charms of her conversation as for her personal beauty. In 1716 she accompanied her husband to Constantinople, whither he was sent as ambassador to the Porte and as consul-general of the Levant. Her letters while abroad, descriptive of the court and society of Vienna, the scenery and customs of the East, of inoculation, of the sultana Hafsen, of the antiquities, baths, mosques, janizaries, and effendis, are among the finest in literature. They display an intelligence, sagacity, and careful observation, that were then especially rare in travellers, and a sprightliness, raciness, and elegance of style of which there are still few examples. They were published surreptitiously after her death (1763), against the wishes of her family and under circumstances which afforded no guaranty for their authenticity, which, however, is in general

proved by the coincidences of style with her other writings, though it is certain that the text has been tampered with and spurious letters introduced; a 4th volume was published in 1767. While in the East she often resided in Belgrade, once crossed the archipelago to the coast of Africa, and returned by way of the Mediterranean and Genoa. At Belgrade she first observed the practice of inoculation for the small pox, by which malady she had lost an only brother and her own fine eye lashes. In 1718 she applied the process after earnest examination to her only son, then 5 years old; and on her return to England the experiment was tried at her suggestion on 5 persons under sentence of death. The success of the trial did not prevent the most violent clamors against the innovation. The faculty predicted unknown disastrous consequences, the clergy regarded it as an interference with Divine Providence, and the common people were taught to look upon her as an unnatural mother, who had imperilled the safety of her own child. Although she soon gained influential supporters, the obloquy which she endured was such as to make her sometimes repent her philanthropy. On returning to England she had at the solicitation of Pope taken up her residence at Twickenham. A rupture soon took place between them, though he had been one of her most intimate correspondents, according to her statement, because she could not refrain from a fit of laughter when at an ill chosen moment he was solemnly and passionately making love to her; and from that time the poet of Twickenham treated her with constant malice. She wrote many witty verses which had success in society, and some of which were printed. In 1789 her health was declining in consequence of a cancer which ultimately proved fatal, and she went abroad with the intention of passing the remainder of her life on the continent. After short tours, she took up her abode in a deserted palace on the shores of Lake Iseo, in the Venetian territory, and afterward in the city of Venice, where she was residing when her husband died in 1761. She was then persuaded by her daughter, the countess of Bute, to return to England, and died within a year. As a lady of wit and fashion she was the most prominent in her time, and her letters still hold an eminent place in that species of literature. The best edition is her "Letters and Works" (8 vols., London, 1887), by her great-grandson Lord Wharncliffe, containing full biographical notices; it is now (1860) being critically edited for Bohn's "Historical Library" by Mr. Moy Thomas. Her letters were edited by Mrs. S. J. Hale (New York, 1856).

MONTAGUE, CHARLES, earl of Halifax, a British statesman and poet, born in Horton, Northamptonshire, April 16, 1661, died May 19, 1715. His father was a younger son of the earl of Manchester. Charles was destined for the church, and after distinguishing himself as a foundation scholar at Westminster was sent to Trinity college, Cambridge, where he became a

pupil and friend of Newton. He wrote there in 1685 some verses on the death of King Charles II., which procured him from the earl of Dorset an invitation to London and an introduction to the wits of the town. In 1687 he joined Prior in the composition of a parody in prose and verse on Dryden's "Hind and Panther" under the title of "The Hind and the Panther Transversed to the Story of the Country Mouse and the City Mouse." He signed the invitation to the prince of Orange, was a member of the convention parliament, and soon afterward, having married the countess dowager of Manchester, gave up the church, and purchased the place of one of the clerks of the council. In 1690 he was again returned to the house of commons, where for some years his life was a series of triumphs. He was chosen in 1692 to conduct on the part of the commons a conference between the two houses of parliament relative to a bill for the regulation of trials in cases of high treason; and the eloquence and ingenuity with which he combated an amendment proposed by the lords which gave peers accused of treason the right of trial in all cases by the whole upper house, placed him in the front rank of parliamentary orators. He was soon called to the treasury board and the privy council, and in 1694 was appointed chancellor of the exchequer, in reward for having devised a scheme for the relief of the financial embarrassments of the government. This was no less than the establishment of the bank of England, the plan of which had been proposed by William Patterson 8 years before, but not acted upon. Montague was the originator of the great recoinage act (1695), of exchequer bills (1696), and of the tax on windows. On May 1, 1698, he was made first lord of the treasury, and appointed one of the regency during the king's absence on the continent; but on the reorganization of the ministry in 1699 he was removed to the auditorship of the exchequer. The next year he was raised to the upper house as Baron Halifax. Shortly after the meeting of the new parliament, in Feb. 1701, he was impeached by the commons, together with Portland, Oxford, and Somers, for advising the king to sign the partition treaties and for other alleged offences; but the prosecution was dropped, and the lords dismissed the articles. After the accession of Queen Anna, being now out of office, he was accused by the lower house of breach of trust in his management of the public accounts while chancellor of the exchequer; but he again escaped by the protection of the house of lords. Montague in fact had not borne with decorum his thickening honors. His arrogance, vanity, and neglect of his old friends had made him a host of enemies. Nevertheless, he proposed and negotiated the union with Scotland in 1707, and was one of the judges in Sacheverell's trial, when he voted for a mild sentence. On the death of the queen he acted as one of the regents, and after the accession of George I. was made earl of Halifax and Viscount Sunbury, knight of

the garter, and first commissioner of the treasury. The rank which Montague has held among the British poets is due mainly to his liberal patronage of letters and his high station.

MONTAIGNE, MICHEL, seigneur de, a French essayist, born at the chateau of Montaigne, in Périgord, Feb. 28, 1533, died there, Sept. 13, 1589. His father, supposed of English descent, was an eccentric feudal baron, who had served in campaigns in Italy, was capable of marvellous gymnastic feats, affected learning, and was famous for paradoxes. An athlete and a scholar, he zealously took charge of the physical and intellectual education of his son. The young Montaigne, "before he could speak," was delivered into the hands of a German tutor, imported expressly for the purpose, who could not speak French, and was directed to confer with his pupil only in the classical tongues. The whole household and even the artisans and peasants of the village learned Latin phrases in order to address the youthful lord, who subsequently states that the whole town had been in danger of losing its native speech, and that many Latin words were permanently introduced into its dialect. At the age of 6 years he was able to converse in Latin with ease and fluency; and his study of Greek had been transformed into a game, which, however, he never mastered. At that age he was sent to the college of Guienne at Bordeaux, then the most flourishing in France; was preferred to the first form on his entrance; and at 13 completed the academical course. His natural indolence seems to have counteracted the effect of his precocious scholarship. Love of liberty and laziness were, he says, his predominating qualities through life. Nothing displeased him more than a matter of deliberation. He never looked over his accounts nor revised his manuscripts; wrote so badly that often he could not read his own hand; particularly hated chess on account of the grave attention it required; never touched a book except when he was weary of doing nothing; had an amazing ignorance of common things, which seemed the greater in consequence of his defective memory; could not remember the names of his servants nor of the current coins; would read a book as new which he had scribbled over with notes a year before; would forget his idea while on the way to the library to record it; knew nothing about the agricultural implements, processes, and products amid which he grew up; and could not swim, fence, carve, guess a riddle, saddle a horse, nor make a pen. "Extremely idle both by nature and art," are his words, "I would as willingly lend a man my blood as my pains." With this disposition he soon forgot much even of his Latin, which was as his mother tongue, and confesses that he only nibbled on the surface of science, and that the only books of solid learning he could ever seriously devote himself to were Plutarch and Seneca. After quitting the college of Guienne he began the study of law, and at the age of 21 became a counsellor in the parliament of Bor-

deaux, an office from which he retired in 1570. There began his friendship with Étienne de La Boétie, whom he had loved before meeting him, whose early death he laments in one of the finest of his essays, whose works he edited, and for whom he mourned during the remainder of his life. He was inclined to an easy neutrality amid the religious and political conflicts of the time; declared that any government that was ancient and had been permanent was preferable to alteration; made frequent visits to court, where he was intimate under successive monarchs; married at the age of 38, which, he remarks, was 2 years below the standard of Aristotle and 3 above that of Plato; and at the age of 38 retired to his chateau. He soon after began the composition of his *Essais*, the first volume of which appeared in 1580, which was enlarged in subsequent editions, receiving its final form in 1588. He was already suffering from the stone and nephritic colic, the attacks of which no philosophy could transform into pleasures; and, with no faith in the medical faculty, he determined to seek relief by travel through the principal countries of Europe. The journal of his tour was discovered and published at Paris in 1574, after having been for nearly two centuries entombed in the family chest in the chateau of Montaigne. The style as well as the antique spelling and handwriting left no doubt of its authenticity. The humors of a valetudinarian seem to have chiefly engrossed his attention. He gauges civilization by the resources and the art of the kitchen. He passes through the scenes of classical antiquity with scarcely a reference to any Roman author. His vanity appears in his ambition for the cordon of the order of St. Michael and for the title of Roman citizen, in his habit of fixing his coat of arms over the door of every room he occupied, in his detailed accounts of attentions received from the great, and in his delusion of the burgomaster of Augsburg into the belief that he and his suite were a company of knights and barons. Some of his descriptions, especially of what he saw in Rome, are made with curious felicity. On his return, he was elected to the office of mayor of Bordeaux, which he held for 4 years, maintaining peace in a time of disorder; and after retiring to his domain, in the very focus of civil war, he refused to fortify his house, leaving it "to the stars to guard," and afterward boasted that his bold frankness had conjured away all dangers from it. He died, surrounded by his friends, prominent among whom was the theologian Charron, at the moment of the elevation in the ceremony of the mass, which at his request was celebrated in his chamber. His *Essais*, to which alone he owes his reputation, profess to have been purely a work of amusement. Informal and irregular, without regard to the rules of art or the show of system, they offer the first modern examples of essays or attempts in distinction from successes and finished works. In an age of pedants, Montaigne appeared as the antagonist of literary

conventionalism, broke through the ceremoniousness of scholastic writing, and defied the domineering pretensions of erudition. His sagacious treatment of every-day life, rich and vigorous language, easy and indulgent gayety, genial egotism, and minute confessions, are among the charms of his work. He defines man as *un être ondoyant*, yielding to all thoughts and all impressions; and he dwells upon the vanity of his wisdom and achievements, the uncertainty, contradictions, fickleness, and failures of the human intellect, even in its best attainments. The motto: *Que sçay-je?* is illustrated by keen perceptions of the strangeness of the commonest things, of the mystery of first principles, of human weakness amid the immensities of the universe, of the force of customary beliefs, of the vast and varying conflict of opinions, and of the absence of any criterion of certainty. He employed the language of Christianity, and both Catholics and Protestants have claimed his sympathies; yet a practical and purposeless heathenism pervades his philosophy. He was a kind of imperfect Socrates, the cross-examiner of his generation, bold, inquisitive, and shrewd, taking nothing on trust, and hating pretence, yet too careless and selfish, and not pure and thorough enough, to give his ideas effect. A monument to him was inaugurated in Bordeaux, Sept. 6, 1858.—There are numerous editions of the *Essais* both in French and English. They were translated into English within 15 years after their publication, and very frequently reprinted in the 17th and 18th centuries. A copy of Florio's translation, the only book known to have been possessed by Shakespeare, is in the British museum with his autograph. The best biographies of Montaigne are by Grün (Paris, 1855), Payen (Paris, 1856), and Bayle St. John (London, 1857).

MONTALANT, M^{LE}. See DAMOREAU.

MONTALEMBERT. I. MARC RENÉ DE, marquis, a French military engineer, born in Angoulême, July 15, 1714, died March 26, 1800. He was descended from an ancient family of Poitou, and received a thorough scientific and literary education. He entered the army in 1731, took an active part in the sieges of Kehl and Philippeburg, in the campaigns of Italy, Flanders, &c., and in 1741 in the war of the Austrian succession. He afterward devoted himself to the study of military science, and in 1747 became a member of the academy of sciences, and about the same time established founderies for the purpose of casting cannon and heavy ordnance for the navy. During the 7 years' war he acted as French commissioner in the Russian and Swedish armies. His innovations in the art of fortification were opposed by the French engineering corps, but the doubts in regard to the efficiency of his system were dispelled by his successful construction of the fort of Ré. He was also employed in the fortifications of Anklam, Stralsund, and the islands of Aix and Oléron. The works in the last named island were constructed after his system. He became a partisan of the

revolution, and relinquished in favor of the national convention the pension which had been conferred upon him by the government in compensation for the loss of an eye in the public service. During the reign of terror he obtained a divorce from his first wife, who was known as an actress and novelist, and married the daughter of an apothecary. He had given up to the government his founderies, without receiving any equivalent for the large capital invested in them, and was involved in further difficulties by the expenses of publication of his works and of his various experiments for the improvement of the military art, and by the depreciation of the paper money which he had received in payment for the proceeds of one of his estates. He had also executed at his own expense and presented to the government various models relating to fortifications and artillery. He assisted Carnot by his advice, and his services as a military reformer were publicly acknowledged by the convention and by the council of 500, and some pecuniary relief was afforded to him, insignificant however in comparison with his great sacrifices and losses. He is said to have withdrawn his name as a candidate for the membership of the institute as soon as he discovered that Bonaparte was his competitor for the honor. He wrote on the war of 1757, on the siege of St. Jean d'Acre, and a historical essay on the founding of cannon, and contributed valuable memoirs to the academy. His great work, *La fortification perpendiculaire, ou l'art défensif supérieur à l'offensif* (11 vols. 4to., Paris, 1776-'96), with illustrations, absorbed in the publication a large portion of his fortune. The 1st volume shows the defects of bastioned fortifications constructed according to the principles of Vauban, and expounds his system of perpendicular fortification; the 2d treats of the construction of redoubts or small forts; the 3d suggests, as defensive works for seaports and as a mode of simplifying the art of fortification, the construction of a crenellated wall covered by a rampart on which are casemated traverses; the 4th reviews military matters under the reign of Louis XIV., and suggests the formation of lines of intrenchment for the defence of the frontiers of a state; the 5th is devoted to the construction of batteries for the defence of sea coasts; in the next 2 volumes the author refutes the objections against his system; the 8th comments on the forts at Cherbourg and on the island of Aix; the 9th is specially devoted to the illustration of the superiority of the defensive over the aggressive system of warfare, and suggests circular redoubts and casemated star forts; the 2 concluding volumes relate to artillery and fortification. Montalembert was a disciple of the German school, and the opponent of Vauban, which subjected him to the attacks of D'Arçon and of other adherents of the antiquated principles of fortification. His system of detached forts inaugurated a new era not only in fortification, but in the attack and defence of fortresses and in strategical

science generally. The superiority of his intrenched camps over those of Vanban has been fully tested in the wars of Napoleon I., and in more recent military operations. His principles have been adopted in the fortifications of Ehrenbreitstein, in the Maximilian towers at Linz (imitations of the *tours de Montalembert*), in the forts of Cologne, Sebastopol, Cronstadt, Cherbourg, in the new batteries at the entrance of Portsmouth harbor, and in most modern forts for harbor defence against hostile fleets. Montalembert is justly regarded as one of the greatest engineers that France or any other country ever produced. (See FORTIFICATION, vol. vii. pp. 620, 621.) II. MARC RENÉ MARIE DE, count, son of the preceding, born in Paris, July 10, 1777, died June 20, 1831. He served in the army of Condé, and subsequently in the English army with the rank of lieutenant. His marriage with Miss Forbes, daughter of James Forbes, a British merchant resident in Guzerat, procured for him a place in the staff of the duke of Wellington during the Spanish campaign. After the restoration he returned to France, and afterward represented his country at the courts of Würtemberg and Sweden. He was raised to the peerage in 1819, and in 1830 gave his adherence to the government of Louis Philippe. III. CHARLES FORBES, count, son of the preceding, a French statesman and author, born in London, March 10, 1810. He received his university education in Paris, and in his 19th year published a small work on Sweden, which introduced him to the acquaintance of M. Guizot. Though educated in the strict Catholic principles of his father, he showed little inclination for his father's absolutist politics, was a disciple of Lamennais, and associated himself with him and Lacordaire in 1830 in founding the democratic ultramontane journal *L'avenir*. While the doctrines of this publication were under examination by the Roman see in 1831, Montalembert and his fellow editors went to Rome to plead their own cause, but met with little encouragement, and in the following year the *Avenir* was formally condemned. In the mean time Montalembert had founded with Lacordaire and De Caux (1831) a free Catholic school in Paris, which was closed by the police. The directors were arraigned before an inferior court for infringing the ordinances on public instruction; but Montalembert, having succeeded to his title by the death of his father, June 20, 1831, availed himself of his rank to have the cause transferred to the court of peers, where in his own defence he delivered his first public speech. The trial, which was only one phase of a long quarrel between the clergy and the university on the subject of education, ended in the condemnation of the young peer to a fine of 100 francs. The papal censure which fell upon Lamennais a few years later had the effect of strengthening Montalembert's attachment to the church, though it did not shake his liberal convictions. He devoted himself to the study of the middle ages, and published in 1836 a

legendary "Life of St. Elizabeth of Hungary, Duchess of Thuringia," with a historical introduction (English translation by Mary Hackett and Mrs. J. Sadlier, New York, 1854), and an essay *Du Vandalisme et du Catholicisme dans les arts* (1840). He spoke frequently in the chamber of peers, where his age gave him all the rights of a member in 1840. In 1842 he opposed M. Villemain's bill for the organization of secondary schools, claiming the right of the church to perfect freedom in matters of education, and protesting against the "university monopoly" which placed all the schools under the control of a faculty of laymen. In 1843 he published his *Manifeste Catholique*, on occasion of the debates in the chamber concerning the relations between church and state. He was now the recognized leader of the Catholic party. He delivered 3 elaborate addresses on the freedom of the church, of education, and of religious orders, in the last of which he eulogized the Jesuits; and in 1847 he founded a religious society to uphold the cause of the Swiss Sonderbund. From time to time he appeared as the advocate of oppressed nations; he spoke in favor of Poland in 1831, 1844, and 1846, and on Feb. 10, 1848, caused a solemn service to be celebrated at Notre Dame in memory of Daniel O'Connell. About the same time, in a speech on radicalism, he predicted a revolution in the course of 8 months. It came sooner than he had expected. At the outset he joined the democratic party, published an address avowing republican sentiments, and was elected by the department of Doubs as a deputy in the constituent assembly. Here, however, he acted rather with the monarchical or moderate party than with the thorough democrats. He opposed the admission of Louis Napoleon, and voted against the new constitution; and toward the close of the session he supported Dufaure's bill for the restriction of the press, and approved the expedition against the Roman republic. Returned to the legislative assembly by the departments of Doubs and Côtes du Nord, he became still more conservative in his policy, and found a natural rival in Victor Hugo, with whom he was engaged in some of the most brilliant contests of oratory to which the French legislative halls had listened for many years. He was one of the committee which drafted the law of May 31, abolishing universal suffrage, and was the originator of a bill for the observance of Sunday, which was not passed. Although at variance with the president, he undertook to defend him against his colleagues in the assembly, whom he accused of the blindest and most unpardonable ingratitude. In June, 1851, he had a memorable debate with Victor Hugo on the proposed revision of the constitution. After the *coup d'état* of Dec. 2 he protested against the imprisonment of the deputies, and became more determined in his hostility to Napoleon; but he obtained a place on the second consultative committee, and a seat in the legislative body, where he was almost the only

representative of the opposition. In 1854 a confidential letter from him to M. Dupin, published without his consent in the Belgian journals and circulated in Paris, gave umbrage to the government, and the assembly authorized his being prosecuted, but the tribunals found no ground for action. In the election of 1857 he was superseded by a more acceptable candidate. He has since lived in retirement, employed in literary labors, and contributing frequently to the columns of the *Correspondant*. An article which he published in this journal, Oct. 25, 1858, entitled "A Debate on India in the English Parliament," led to his prosecution on account of invidious comparisons between the institutions of France and Great Britain. He was sentenced to a fine of 3,000 francs and 6 months' imprisonment, which was reduced by a higher court to 3 months; but both penalties were remitted by the emperor. He has been a member of the French academy since 1862. Beside the works already mentioned, he has written *Du devoir des Catholiques dans la question de la liberté d'enseignement* (1844); *Saint Anselme, fragment de l'introduction à l'histoire de Saint Bernard* (1844); *Quelques conseils aux Catholiques sur la direction à donner à la polémique actuelle et sur quelques dangers à éviter* (1849); *Des intérêts Catholiques aux XIX^e siècle* (1852; English translation, 1853); *L'avenir politique de l'Angleterre* (1855; English translation, 1856), in which he attempts to show that the interests of England are identical with those of freedom throughout the world; *Pie IX. et Lord Palmerston* (1856); *La paix et la patrie*; and a review of the memoirs of the duke de St. Simon. The last 3 publications were reprinted from the *Correspondant*. He has contributed to the *Revue des deux mondes* and the *Encyclopédie Catholique*, and is now engaged on a work entitled *Les moines d'Occident depuis Saint Benoît jusqu'à Saint Bernard*, to be completed in 6 volumes, the first 2 of which appeared in Paris in Aug. 1860, and were soon followed by an English translation.

MONTALVAN, JUAN PEREZ DE, a Spanish dramatist, born in Madrid in 1602, died in June, 1638. His father was the king's bookseller, and the son was educated for the church, making such progress in his studies that he became a licentiate in theology at the age of 17. He enjoyed the friendship and instruction of Lope de Vega, and before he had passed boyhood was a writer for the stage. In 1622 he gained a prize for a poem at the festival of San Isidro at Madrid, and soon afterward received the degree of D.D. and an office in the inquisition. The stage, however, was more to his taste than the pulpit. By the time he was 80 years old he had written 86 dramas and 12 *autos sacramentales*, or sacred representations for the festival of Corpus Christi; but the excess of his labors unsettled his mind, and he died insane. He left about 60 plays, two volumes of which he himself prepared for publication. Among the most popular are the "Lovers of Teruel,"

"Most Constant Wife," and "No Life like Honor." He took Lope de Vega for his model, and though he often wrote in bad taste and lacked skill in construction, his dramas are never uninteresting, and are full of fine poetic feeling. He wrote *Orfeo*, a poem (1624); an extravagant "Life and Purgatory of St. Patriok" (1627); a collection of stories under the title *Para Todos* ("For Everybody," 1632); and a panegyric on Lope de Vega (1636).

MONTANELLI, GIUSEPPE, an Italian author, born at Zuccacchio, Tuscany, in 1818. He was graduated as a lawyer at the university of Pisa in 1881, and was one of the early contributors to the patriotic *Antologia* published at Florence, and of other periodicals. He devoted himself to the practice of his profession from 1837 to 1840, when he accepted the chair of Tuscan law and commercial jurisprudence in the university of Pisa. He founded a secret political association and a new liberal journal. Severely wounded at the battle of Curtatone (May 29, 1848), he was captured by the Austrians, and only liberated after the capitulation of Milan. He was appointed by the grand duke of Tuscany a member of his new administration, and after the flight of that sovereign (Feb. 1849) he became one of the triumvirs of Tuscany. Guerrazzi, who was afterward appointed dictator, sent him to Paris to recruit soldiers, and he remained there in consequence of the restoration of the old government of Tuscany. He has published his memoirs (Turin, 1853-5), and has written for Mme. Ristori a tragedy entitled *Camma*, and prepared for the same actress an Italian version of Legouvé's *Médée* (Paris, 1856).

MONTANISTS, a sect of the 2d century, so called after Montanus of Phrygia. He is said to have been originally a priest of Cybele, and to have announced himself about 160 as a prophet, who was to carry Christianity forward to perfection. He taught a permanent extraordinary influence of the Paraclete, manifesting itself by prophetic ecstasies and visions, assigned to doctrines and rites a subordinate significance, and demanded the most rigid asceticism as a manifestation of internal purity. Beside the ordinary fasts, he prescribed annual and weekly ones, declared second marriages and flight from persecution to be sins, and absolutely forbade the re-admission of some classes of the *lapsi* into the church. He represented the beginning of the millennium as being very near at hand, and Pepuza in Phrygia as the place which would be its centre. His followers, who were also called Cataphryges and Pepuziani, found a zealous and gifted advocate in Tertullian, and included many prophetesses, among whom Maximilla and Priscilla are especially celebrated. The members of the ruling church were designated by them as *psychici*, while they assumed themselves the name *pneumatici*. They were opposed especially by the Alexandrian school, and condemned by several provincial councils. They were very numerous in Mysia, Lydia, and Phrygia, where some towns, as Pepuza and Thyatira, were exclusive-

ly inhabited by them. Thence they spread into other parts of Asia Minor, especially into Cappadocia, Galacia, and Cilicia. In Constantinople and Carthage also they were for some time very numerous. The literature of the modern Tübingen school represents Montanism as a re-action of Jewish Christianity against Paulinism.—See Wernsdorf, *De Montanistis* (Dantzic, 1751; strongly in their favor); Münster, *Effata et Oracula Montanistarum* (Copenhagen, 1829); Kirchner, *De Montanistis* (Jena, 1832); Schweigler, *Der Montanismus und die christliche Kirche des zweiten Jahrhunderts* (Tübingen, 1841); Baur, *Das Christenthum und die christliche Kirche der drei ersten Jahrhunderte* (2d ed., Tübingen, 1860).

MONTANUS. See **MONTANISTS.**

MONTANUS ARIAS. See **ARIAS MONTANUS.**

MONTAUBAN, a town of France, capital of the department of Tarn-et-Garonne, on the right bank of the Tarn, 842 m. S. W. from Paris; pop. in 1856, 23,565. It was one of the first towns in France that embraced Protestantism, and the members of the reformed religion there were subjected to direful persecution by Louis XIV. The town contains a college for the education of Protestant clergymen.

MONTCAIM, LOUIS JOSEPH DE SAINT VÉRAN, marquis de, a French soldier, born in the chateau of Candiac, near Nîmes, in 1712, died in Quebec, Sept. 14, 1759. He entered the army when 14 years old, served in Italy as early as 1734, distinguished himself in Germany under Belle-Isle during the war for the Austrian succession, and fought in Italy again, where he gained the rank of colonel in the disastrous battle of Piacenza (1746). In 1756, being then a brigadier-general, he was appointed to command the French troops in Canada, where he arrived about the middle of May, and soon after began operations against the English with great activity and success. Fort Ontario at Oswego was carried on Aug. 14, after a brisk and well conducted attack. The next year he forced Fort William Henry, at the head of Lake George, which was held by a garrison of over 2,500 men, to surrender at discretion, and thus became possessed of 43 guns and large stores of ammunition and provisions, which were invaluable to his nearly destitute army. Scarcity of food had been one of his great difficulties; the harvest in Canada had failed, and the French government was reluctant to send out supplies which were liable to be captured by the English cruisers. Montcalm had beside to oppose an enemy far superior in numbers and discipline to his own troops, which consisted mostly of Canadian volunteers. Notwithstanding these disadvantages, he held his ground firmly, when, in the campaign of 1758, the English under Abercrombie marched from the south toward the French dominions. Montcalm occupied the strong position of Fort Carillon (Ticonderoga), made it still stronger by intrenchments, in constructing which he worked with the common soldiers,

and at the head of about 3,600 men awaited the attack of over 15,000. After a fierce battle which lasted 4 hours (July 8, 1758), the British retreated in disorder. The personal bravery which Montcalm had evinced increased his popularity among his soldiers; and if he had received timely reinforcements, he could have maintained the supremacy of the French in North America. But the want of energy on the part of the home government, the scarcity of food all over New France, and personal dissensions between the governor and the military commander, forbade him to look for much assistance; and in the midst of victory he expressed his conviction that in a few months the English would be masters of the French colonies in America. Resolved, however, to struggle to the last, and, as he himself said, "to find his grave under the ruins of the colony," he actively prepared for the campaign of 1759. The English, on the other side, spared no exertions to make their conquest sure; troops were sent from Europe; the colonial regiments were thoroughly reorganized; and a strong fleet was to coöperate with the land forces. While Amherst and Prideaux were manoeuvring to dislodge the French from their posts in the vicinity of Lake George and Lake Ontario, Gen. Wolfe, at the head of 8,000 chosen troops, supported by the fleet in the St. Lawrence, presented himself before Quebec. The success of the whole campaign, or more properly the conquest of Canada, depended upon the taking of that city; and to protect it Montcalm had concentrated his principal forces on the banks of the Montmorency river. Being attacked in front by Wolfe, on July 31, he repelled him with considerable loss. Wolfe then changed his plans; he secretly landed his troops by night on the left bank of the St. Lawrence, above Quebec, climbed the table land that overhangs the city, and on the morning of Sept. 13 appeared with his whole force on the heights of Abraham, in the rear of the French army. Montcalm flew at once to oppose his advance, and by 10 o'clock the two armies, about equal in numbers, each having fewer than 5,000 men, were drawn up before each other. Montcalm led the attack in person, but his troops soon broke before the deadly fire and unflinching front of the British; and when Wolfe, placing himself at the head of the 28th and the Louisburg grenadiers, gave the order to charge with bayonets, they fled in every direction. The gallant British general fell in the moment of triumph; Montcalm, having received one musket ball earlier in the action, was mortally wounded while attempting to rally a body of fugitive Canadians a few moments after Wolfe was borne from the field. On being told that his death was near: "So much the better," he said; "I shall not live to see the surrender of Quebec." He died the next morning, and his death was followed by the loss of all Canada, where his career, as Bancroft observes, had been "a wonderful struggle against inexorable destiny."

MONTCAIRM DE CANDIAC. See **CANDIAC**.
MONTEBELLO, a small village of Sardinia, on the road which passes from Alessandria and Voghera through Casteggio to Piacenza, about 5 m. S. of the Po and 1 m. W. of Casteggio. It was the scene of a victory of Lannes over the imperialists during Bonaparte's second Italian campaign, June 9, 1800, from which Lannes took the title of duke of Montebello, and of an engagement between the French and Sardinian allies and the Austrians, May 20, 1859. The latter was the first battle of the Italian campaign of 1859. The allies, whose head-quarters during the month of May were at Alessandria, endeavored, prior to crossing the Mincio at Turbigo and Buffalora (see **MAGENTA**), to create an impression that they intended to attack by Pavia and Piacenza, and with this view concentrated a large part of their force in that direction. The Austrian commander, Count Gyulai, deceived by their movements, accordingly ordered Gen. Stadion to cross the Po below Pavia with 20,000 men, and march along the S. bank of the river, in order to make a reconnaissance in force. About 11 o'clock two brigades of his detachment under Gen. Urban reached Casteggio, which they found occupied by a regiment of Sardinians and 500 men of Gen. Forey's division, belonging to the corps of Baraguay d'Hilliers. These were soon overpowered and driven back through Montebello and Ginestrello toward Voghera; but, reinforced by the arrival of successive detachments from Voghera, they rallied and obliged the Austrians to fall back upon Montebello. Here a final stand was made. Gen. Urban by his rapid advance had deprived himself of the assistance of most of the remainder of Stadion's force, while the French continued to receive accessions, train after train arriving by railway, discharging its hundreds, and hastening back for more. Gen. Forey, bringing up his left to the N. of the village, opened there an effective fire of artillery, while his right wing was engaged in a hot hand to hand combat on the south. The Austrian brigades of Bils and the prince of Hesse at last came up, but the allies continued to maintain a superiority, and about dusk the Austrians retreated. They were not pursued. Their loss in killed, wounded, and missing was officially stated as 1,291, and that of the allies as 850. The Austrians, according to French accounts, had 18,000 men in action, while the allies had 7,000; but the Austrians estimated the force of their enemy as high as 40,000. Both sides claimed the advantage of the battle. The Austrians effected their purpose of ascertaining their adversaries' strength, while the allies confirmed Count Gyulai in the belief that they were about to march toward Pavia.

MONTECUOULI, or **MONTEUCOULI**, RAIMONDO, count, prince of the German empire, and duke of Melfi, an Austrian general, born in the territory of Modena in 1608, died in Linz, Oct. 16, 1681. He enlisted in 1627 in the Austrian artillery, under his uncle Count Ernesto, and distinguished himself in the 30 years' war. On

Sept. 7, 1681, he took part in the battle of Breitenfeld, where he was severely wounded and made prisoner during the retreat. He was liberated in 1682, and the gallantry he displayed in the assault on Kaiserslautern, July 17, 1685, was rewarded by promotion to a colonelcy. In 1689, while attempting to prevent the Swedes from crossing the Elbe at Melnik, in Bohemia, he was worsted and fell into the hands of the enemy. During a captivity of over 2 years, he studied thoroughly the science of war. On his release he joined the imperial army in Silesia, defeated the enemy at Troppan, and took the town of Brieg. On the outbreak of war in Italy, he repaired thither and received from the duke of Modena the title of brigadier-general and the command of his cavalry; but he soon returned to Austria, was in 1644 appointed field marshal lieutenant and a member of the aulic council, supported in 1645 the archduke Leopold in his expedition against Rákóczy, and was sent to oppose Turenne on the Rhine. The next year, in conjunction with Johann De Werth, he completely routed the Swedes in Silesia, and received the rank of general of cavalry. After the peace of Westphalia he visited Modena; and in 1658, at the marriage festivities of Duke Francis I., he had the misfortune to kill one of his friends, Count Manzani, in a tournament. Being in 1657 placed in command of the army sent by the emperor to protect John Casimir of Poland against the Transylvanians and the Swedes, he forced Rákóczy to make peace. Promoted to the rank of field marshal, he was the next year sent to relieve Denmark, succeeded in rescuing Copenhagen from the attacks of the Swedes, and expelled them from Jutland and the island of Fünen. Peace being finally re-established in the north by the treaty of Oliva (1660), he was intrusted with the command of the army which the emperor sent against the Turks, whom he drove from Transylvania, and kept at bay until he had received reinforcements from Germany, France, and other powers, and gained (Aug. 1, 1664), on the banks of the Raab, the celebrated victory of St. Gotthard, which for the time rid Christian Europe of its Turkish invaders. When in 1672 the ambition of Louis XIV. threatened Holland, Montecuculi was placed at the head of the imperial army which took the field in behalf of the Dutch, and baffled the plans of Turenne, whom he worsted on several occasions. For a while superseded in the command by the elector of Brandenburg, he was soon recalled (1675), as the only general who could hold his ground in presence of the great French marshal. He wisely avoided a pitched battle, and for 4 months conducted a series of operations in so masterly a manner as to elicit the admiration of his opponents. On the death of Turenne he drove the French army across the Rhine, and invaded Alsace; and his progress could be stopped only by the prince of Condé, who obliged him to raise the siege of Haguenau and recross the Rhine. This was the last campaign

of these eminent warriors. Condé, who was but 54, retired to Chantilly; Montecuculi, who was 12 years older, returned to Vienna. He now devoted his time to science, art, and literature. The dignity of a prince of the German empire was conferred on him by the emperor Leopold in 1679, and soon afterward the king of Naples gave him the duchy of Melfi. While accompanying the emperor to Lintz, he was fatally injured by the fall of a beam. One of his favorite sayings was that three things were required for going to war: 1, money; 2, money; and 3, again money. He was noted for his strategical knowledge and for his learning; and he left a personal memoir (translated into Latin under the title of *Commentarii Bellici*, fol., Vienna, 1718), containing disquisitions on the military art and an account of his campaigns against the Turks. His writings were published in the original Italian by Ugo Foscolo (2 vols. fol., Milan, 1807-'8), and by J. Grassi (2 vols. 4to. and 8vo., Turin, 1821). He is also the author of some poems and of other writings still unpublished.

MONTÉGUT, EMILE, a French author, born in Limoges, June 24, 1826. He studied law, but devoted himself to literature. His first article in the *Revue des deux mondes* appeared in 1847, and was followed by many other elaborate and discriminating reviews, which have placed him in the front rank of French essayists and critics. He was among the first to familiarize the French public with the writings of Emerson, of whose essays he has made a translation, with an introduction (Paris, 1850). He has also begun a translation of Macaulay's "History of England" (vols. i. and ii., 18mo., 1858). In 1858 appeared a collection of a number of his essays under the title of *Libres opinions, morales et historiques*, the most remarkable of which are on Werther, on universal monarchy, on human individuality in modern society, and on the omnipotence of industry. Since 1857 he has been the regular literary editor of the *Revue des deux mondes*, to which he is also a constant contributor.

MONTÉMOLIN, COUNT OF. See CARLOS, vol. iv. p. 489.

MONTEN, DIETRICH, a German artist, born in Düsseldorf in 1799, died in Munich, Dec. 18, 1848. He studied at the academy of his native city, and under Peter Hess at Munich, and enlarged his knowledge by the inspection of the principal collections of art in Italy and Germany. He became eminent as a painter of battles, and was employed by Cornelius in preparing the battle scenes of one of his most celebrated frescoes. Among his most esteemed works are "The Departure of the Poles from their native Country in 1831;" "The Death of Max Piccolomini;" "The Death of Gustavus Adolphus near Lützen;" and "The Death of Duke Frederick William of Brunswick in the Battle of Quatrebras."

MONTENEGRO, or TOHERNAGORA (Turk. *Karadagh*; Alb. *Mâl Zëa*, or *Mâl Eyyê*, Black Mountains), a half independent principality in Turkey near the gulf of Cattaro and lake of Scu-

tari, bounded N. by the Turkish provinces of Herzegovina and Bosnia, E. and S. by Albania, and W. by the Dalmatian circle of Cattaro, between lat. 42° 10' and 42° 56' N., and long. 18° 41' and 20° 22' E., including the eastern Kutska district, which seceded in 1848 from Montenegro; area, about 1,500 sq. m.; pop. nearly 120,000, chiefly Slavic, $\frac{1}{2}$ of whom are fighting men. It is divided into 8 departments or *nahia*, each composed of several communes. Capital, Cetigne. It has hardly any plains. The limestone ridges of the Dinaric Alps which traverse it, occasionally diversified by lofty peaks, are so rugged and rocky that the people have the common saying: "When God was in the act of distributing stones over the earth, the bag that held them burst and let them all fall upon Montenegro." The highest summits of the principal mountains reach from 5,000 to 6,000 feet. The few larger streams, as well as the small rivers, all run into the lake of Scutari. The most common trees are the alder, ash, beech, fir, hazel, oak, ilex, walnut, willow, and poplar. The most valuable tree is the sumach called *scottano* (*rhus cotinus*), the wood of which yields a yellow dye; its leaves are used for tanning leather. The mulberry, olive, peach, pomegranate, and other fruit trees, and the vine, are cultivated, and flourish particularly in the department of Tchernitza, between the lake of Scutari and Dalmatia, which produces honey, almonds, figs, excellent quinces, and wine superior to that of Dalmatia. The chief productions are maize (which grows in the greatest luxuriance in the valley of Bieloparlich), potatoes, and tobacco. Agriculture is in a backward condition, but every piece of land capable of tillage is planted. Goats, pigs, and sheep are numerous. The winters in Montenegro are very cold, but the climate is healthful and invigorating.—The total number of settlements is between 200 and 800, mostly villages situated in hollows and on the slopes of mountains, with the houses or huts in many instances detached and scattered. In the most desolate parts of the country the Montenegrin huts are even more miserable than Irish mud cabins. The people bake their bread in the ashes, without leaven. Chimneys are almost unknown, as well as watches and clocks. Of the inhabitants an English writer says: "All appear muscular, strong, and hardy in Montenegro; and the knotted trees, as they grow amid the crags, seem to be emblematical of their country, and in character with the tough, sinewy fibre of the inhabitants." The men attend to the tillage of the land, but never lay aside their arms and never undress during the night, being always ready for marauding expeditions and for encounters with the Turks. All the inferior drudgery of in-door and out-door work is performed by the women. The men wear a white or yellow cloth frock, reaching nearly to the knees, secured by a sash round the waist; under it is a red cloth vest, and over it a red or green jacket without sleeves, both richly embroidered, and the whole covered with

a jacket bordered with fur. They wear a red Fes cap and white or red turban, below which protrudes at the back of the neck a long lock of hair. The women wear a frock or pelisse of white cloth and open in front, but much longer than that of the men, and trimmed with various devices and with gold ornaments in front as well as round the neck. The red cap of the girls is covered with Turkish coins arranged like scales. The red cap of the married women has instead of coins a black silk border, and on gala days a bandeau of gold ornaments. Women and men wear *opanche* (sandals), the soles of which are made of untanned ox hide, with the hair taken off and that side outward, and which enable them to run over the steepest and most slippery rocks with facility. Men and women carry the *struscha* (somewhat like the Scotch plaid) over their shoulders. The chief occupation, next to agriculture, is fishing; but their favorite pursuit is pillage and war. Like the old Scotch borderers, they consider their forays for cattle as feats of chivalry. From their earliest childhood they spend their leisure time in firing at a target. M. Bronieffski, a Russian naval officer who travelled in Montenegro, says: "A Montenegrin is always armed, and carries about during his most peaceful occupation a smooth-barrelled gun of great length, pistols, a yataghan (a long knife for cut and thrust worn in the girdle), and a cartridge box. He climbs the steepest rocks with the greatest facility, and bears with patience hunger, thirst, and every privation. Inhabiting mountains which present at every step passes where a handful of brave men may arrest the progress of an army, the Montenegrins are not afraid of a surprise, particularly as they have on their frontier a constant guard; and the whole of their force may be collected within 24 hours upon the threatened point. When the enemy is in great force, they burn their villages, devastate their fields, and, after having enticed him into the mountains, they surround him and attack him in a most desperate manner. When the country is in danger, they forget all personal feelings of private advantage and enmity; they obey the orders of their chief, and like gallant republicans they consider it a happiness and a grace of God to die in battle. It is in such a case that they appear as real warriors; but beyond the limits of their country they are savage barbarians, who destroy every thing with fire and sword." The heads of the slain are exposed as trophies, and medals are given to those who have taken a stated number.—The imports of Montenegro are cattle and some horses, tobacco, salt, copper, iron, oil, wax, candles, wine, brandy, coffee, sugar, arms, gunpowder, lead, flints, glass, shoes, sandals, Fes caps, &c. The exports are smoked mutton, sumach wood and leaves, salted and dried fish, wax, honey, tobacco, vegetables, fruits, cattle, some silk, &c. The principal market is Cattaro. Carts being unknown, the produce is carried thither chiefly by women, and it is only in the eastern regions of the country that they are assisted

in their labor by the use of mules and asses. Though so near the sea, there is no port and no outlet to the shore, and the Montenegrins are dependent on the Austrian government for permission to pass the goods intended for exportation or received from abroad by way of the Adriatic. Manufactures are limited to articles of immediate necessity. The daily wages of a laborer are a piece of 20 *carantani*, equal to 16 cents. This and other Austrian coins and Turkish paras (chiefly used as female ornaments) are the only currency, no money being coined in Montenegro. Taxes are levied on each household, the total amounting to about \$15,000 annually, which, together with duties on salt, fish, and dry meat, the monopoly of tobacco, the land rent of several convents, and the amount contributed by Russia toward the public expenditures of Montenegro, make up an annual revenue of nearly \$40,000.—The Montenegrins are all of the non-united Greek church excepting a few Roman Catholics, and every village has its church. The spiritual and secular power was united in the *eladika* or prince bishop until after the accession of the late Prince Danilo (1852). The number of priests is about 200; they join in war and the other occupations of the people, and some of them hold office or are engaged in trade. The czar is the head of the church. As the marriage of priests must take place before they can be consecrated, the marriage ceremony is performed during childhood, and the young girl destined to become the priest's wife is facetiously called *popaya*. The principal convents are those of Cettigne, Ostrok, and St. Stefano. Education is neglected, and many of the priests are unable to read and write. Several schools were established however in 1841, and a printing press in Cettigne, which has issued a Montenegro almanac and several books.—The language of Montenegro is a very pure dialect of the Slavic, not corrupted by admixture with foreign words. The people themselves call it a Servian dialect, and Count Krasinski states, in his "Montenegro and the Slavonians in Turkey" (London, 1855), that "it is considered the nearest of all the Slavonic dialects to the original Slavonic tongue; i. e., that into which the Scriptures were translated by St. Cyril and Methodius in the 9th century, and which still continues to be the sacred tongue of all the Slavonian nations who follow the eastern church."—In ancient times Montenegro formed part of Illyricum. The present principality afterward constituted the S. W. corner of the old kingdom of Servia, which in the 14th century, under the reign of Stephen Dushan, extended from the Adriatic to the Black sea, and from the archipelago to the Danube. Toward the end of that century King Lazarus lost his throne and life, and Servia became tributary to the Porte. Montenegro, or Zita as it was then called, secured its independence under the rule of Prince George Balaha, who had married a daughter of the late Servian king. Their son Stratzimir was called from his dark complexion Tchernois (black), and

gave his name to the family of Tchernoievitch, first adopted by Stephen, the son of Stratzimir. Stephen was a contemporary of the famous Albanian chief Castriot, better known as Scanderbeg, whom he assisted against the Turks. On the death of Scanderbeg (1467), Montenegro as well as Albania was invaded by the Turks, and Ivan Tchernoievitch, who had succeeded his father Stephen as ruler of the former country, was compelled to evacuate the town of Zabliak, which had been the capital of himself and his predecessors, and to retire to Cettigne, which henceforth became the seat of the government, and the metropolitan see (1485). Ivan's son and successor, George Tchernoievitch, was the last secular ruler of Montenegro. Having married a Venetian lady, he retired with her to her native city, transferring the government to the hands of the spiritual chief, from which time (1516) dates the commencement of the theocratic form of government in Montenegro. Turkey regarded and still regards Montenegro as a portion of the pashalik of Soutari, and in 1628 Suleyman, pasha of Soutari, invaded the country with a powerful army, but was repulsed with severe losses. In the latter half of the 17th century Danilo Petrovitch was elected vladika or prince bishop, and from that time the power has continued in the Petrovitch family. At the beginning of the 18th century the Montenegrins sought the protection of Russia against Turkey, engaging to coöperate with the czar in his wars against the Porte, and made several incursions into the enemy's territory. The Turks thereupon sent several expeditions to Montenegro, one of which in 1714, consisting of 120,000 men, defeated the Montenegrins, upward of 20,000 of them being carried into captivity; the Turks laid waste the country with fire and sword, and the vladika was compelled to seek refuge in Venice. The war that followed between the Turks and Venetians caused the former to abandon Montenegro, when the fugitive inhabitants returned and rebuilt their villages. During all this time the Montenegrins continued to receive pecuniary assistance from Russia. From 1767 to 1778 an adventurer named Stiepan Mali (Little Stephen) obtained much influence over a great part of the population of Montenegro by passing himself off as the czar Peter III., who had been strangled in 1762, although he was denounced as an impostor by the vladika and the Russian government through a special envoy, Prince Dolgoruki. He finally lost his influence by his want of personal courage, and was murdered in the convent of Stanievitch, to which he had retired. In 1768 the gallant mountaineers again resisted the Moslem invaders; and during the Russian-Austrian war against the Porte, they defied the Turks within their own territory. In 1796 a battle was fought between the Montenegrins under their vladika, Pietro I., and the Turks under the pasha of Soutari, which was the most decisive that ever took place between them, and established the virtual independence of the country; 80,000 Turks

perished, and the moral effect of this victory has continued to the present day. At the close of the 18th and beginning of the present century the Montenegrins aided the Russians against the French in the attack on Ragusa, the capture of Ourzola, and on other occasions. After the peace of 1814 the Montenegrins remained for some time in quiet. In 1820 their territory was again invaded by the Turks under the vizier of Bosnia, who were completely defeated and obliged to retire with heavy loss. The conflicts with the foreign enemy, however, were no sooner terminated than the tranquillity of the country was disturbed by bloody feuds at home. The highly revered vladika Pietro I., on the day before his death (Oct. 17, 1830), implored his subjects to abstain in future from intestine commotions; and his successor Pietro II. introduced various reforms in the administration of justice, and established a senate, now consisting of 12 members, in whom the executive power was vested. All taxes were abolished, the emperor Nicholas having on his accession in 1825 paid 17 years' arrears of the annual Russian contribution of about \$20,000. The Turks attacked the country in 1832 in order to regain one of the departments which had joined Montenegro in the preceding year, but were repulsed. Hostilities with Austria were terminated by the treaty of 1840, by which the Montenegrin boundary was defined. From that time, however, till the death of the vladika (1851), the country was again distracted by almost uninterrupted skirmishes with the Turks. His successor and nephew Danilo, after having received in St. Petersburg in due form the title and dignity of prince bishop, afterward commenced his reformatory measures by separating the religious from the civil power, assuming the throne as the first secular prince under the name of Danilo I., which caused Russia to withdraw her subsidies (but more recently they were again paid into the Montenegrin treasury), and which, together with the imposition of onerous taxes, caused much agitation in the country. This was skilfully used by the Turks in fomenting insurrections in various parts of Montenegro, and in reasserting their claims upon the possessions of the territory. Omer Pasha entered upon formidable operations against the Montenegrins, Jan. 12, 1858; and although his enemies successfully invaded his own camp (Jan. 16), Grahova was stormed (Jan. 19), and the position of Montenegro was most critical, when peace was restored by the intervention of Austria and by the mediation of other powers, about Feb. 15, 1858. Danilo sought in vain to obtain the acknowledgment of the sovereignty of Montenegro by the European powers, although he repaired at the beginning of 1857 to Paris for the furtherance of that object. His endeavors to establish a permanent settlement with Turkey were likewise unsuccessful, while at home his government was obstructed by conspiracies chiefly instigated by his uncles. Danilo however displayed much en-

ergy in improving the laws and the condition of the country, but also much cruelty in punishing his opponents. Many executions took place, and among those banished to Constantinople was the young and talented Montenegrin poet Stephen Petrovitch Cuca, whose death (June 10, 1857) was greatly deplored. Fresh collisions with Turkey took place in 1858; and one of Danilo's uncles was detected in treasonable proceedings. From that time until the present the country has remained in an unsettled condition, in the midst of which Danilo was assassinated (Aug. 11, 1860) and succeeded on the throne by Nicolo Petrovitch, who was, from Aug. 1858, to March, 1860, a pupil in the lyceum of Louis le Grand in Paris, and who is described as an accomplished young man, of great independence of character. His first official act was to dismiss the bishop of Montenegro, on account of his conduct during the funeral of the late prince. An insurrection was suppressed in blood.

MONTEREY, a W. co. of Cal., bordering on the Pacific, bounded E. by the coast range of mountains, intersected by the Salinas or Buena-ventura river, and drained also by the Carmelo, San Benito, and Pajaro; area, 5,000 sq. m.; pop. in 1856 estimated at 4,592. The surface is traversed by several elevated ranges, and is principally employed for stock raising; about 250,000 acres are estimated to be susceptible of cultivation, of which about 8,000 were in 1858 under the plough. The best land lies in the valleys of Pajaro, San Juan, Carmelo, and Salinas, and the varieties of elevation permit the production of a great diversity of fruits, of which those that reach the greatest perfection are the fig, peach, apricot, grape, apple, pear, and olive. Silver, copper, lead, quicksilver, and granite are among the mineral resources. The productions in 1858 were 28,610 bushels of wheat, 76,428 of barley, 6,000 of beans, 245,000 of potatoes, 4,080 tons of hay, and 20,000 lbs. of butter.—MONTEREY, the capital, is on the S. side of the bay of the same name, in lat. 36° 38' 24" N., long. 121° 52' 25" W., 94 m. S. E. from San Francisco; pop. in 1856 about 2,500. The harbor affords an excellent anchorage, but is exposed to the prevailing N. W. winds. It was selected in 1770 by Father Junipero Serra for a missionary station, and was the capital of California until 1847. The old town is built of adobe, the modern chiefly of wood.

• MONTEREY, a city of Mexico, capital of the state of Nuevo Leon, on the San Juan river, a tributary of the Rio Grande, about 80 m. N. E. from Saltillo, and about 500 m. N. from the city of Mexico; pop. in 1858, 17,399. From its position near the Rio Grande it carries on an extensive commerce with the towns on that river, and receives large quantities of American goods, which are distributed to various parts of Durango and Zacatecos. Its increasing business has made it the most thriving city in northern Mexico. Its houses are well built, chiefly of limestone; but some are constructed of adobe. The streets are paved and clean. The city stands

upon a broad plain 1,626 feet above the level of the sea, and is embosomed among beautiful gardens and orchards.—In the early part of the war between the United States and Mexico, Monterey, which occupies a strong natural position and was well fortified by art, was held by the Mexican Gen. Ampudia with about 10,000 regular troops. In Aug. 1846, Gen. Taylor, with a force of 6,625 men, mostly volunteers, marched from Matamoras to attack Monterey; and on Sept. 9 he encamped within 8 miles of the place. Ten days were spent in reconnoitring, and on the afternoon of Sept. 19 Gen. Worth was ordered to march with his division around the hill occupied by the bishop's palace, to take a position on the Saltillo road, and to carry the enemy's detached works in that quarter, while the main body of the army were to make a diversion against the centre and left of the town by batteries erected during the night. In the morning these batteries opened upon the city, which replied by a heavy fire from the citadel and other works. The lower part of the city was assaulted and entered by the Americans, and a Mexican work of great strength captured after hard fighting by a brigade under Gen. Quitman. Gen. Butler also entered the town at another point with the first Ohio regiment. Meanwhile Gen. Worth carried the heights south of the river and the Saltillo road, and turned the guns of the Mexican works in that quarter upon the bishop's palace. The Mexicans evacuated the lower part of the city during the night, and early next morning Gen. Worth stormed the height overlooking the bishop's palace; and by noon that stronghold itself was taken by the Americans, and its guns turned upon its flying defenders. The houses of the city being solidly built and capable of defence, and the streets strongly barricaded, the Americans were forced to take each house in succession by breaking through the walls till they reached the principal plaza. The conflict lasted till the 23d, the Mexicans contesting desperately every foot of ground till nothing remained in their possession but the citadel. On the morning of the 24th Gen. Ampudia capitulated, and was allowed with his army to march out with the honors of war. The loss of the Americans in these operations at Monterey was 120 killed and 868 wounded. That of the Mexicans was not ascertained, but was probably much greater.

MONTESPAN, FRANÇOISE ATHÉNAÏS DE ROCHECHOUART DE MORTEMART, marquise de, one of the mistresses of King Louis XIV. of France, born in 1641, died in 1707. She was first known by the name of Mlle. Tonnay-Charente, and figured among the maids of honor to the duchess of Orleans. At the age of 22 she married Pardailhan de Gondrin, marquis of Montespan, was officially presented at court, and became lady in attendance to the queen. Her "surprising beauty," graceful figure, wit, and conversational powers at once made a sensation; but for several years the king seemed scarcely to notice her. At last, when he began

to tire of Mlle. La Vallière, he turned his eyes upon the brilliant marchioness, who secretly became his mistress about 1668, and was openly declared as such two years later. Her husband vainly attempted to prevent or at least to break off the connection; his passionate appeals and reproaches were answered by banishment to his estate. There he dressed in black like a widower, and entirely ignored his faithless spouse, from whom he was legally separated in 1676. Mme. de Montespan for 14 years was the soul of the court, and the dispenser of favors. Her influence over the king was unbounded; she prevailed upon him to legitimate their children, who were confided to the care of the widow Scarron, afterward Mme. de Maintenon, who in time supplanted Mme. de Fontanges, the immediate successor of their mother in the royal affections. She was not easily reconciled to a separation, but clung obstinately to what she considered her "office," and spared no exertions to bring the king back to her. Finally deciding to leave the court in 1686, she first retired to a convent and tried in vain to be reconciled to her husband. She now devoted herself passionately to religion, subjecting herself to penance and mortification, distributing most of her income to the poor, and endeavoring in every way to make amends for her past follies. Her mind, however, could not gain peace; and during a journey to Bourbon L'Archambault, made to relieve her restlessness, she was seized by an illness which suddenly ended her life. Her children by the king were: the duke of Maine, Mesdemoiselles de Nantes, de Blois, and de Tours, and the count of Toulouse, beside 8 others who died in childhood.

MONTESPAN, LOUIS ANTOINE DE PARDEIL-LAN DE GONDREIN DE. See ANTIN, MARQUIS D'.

MONTESQUIEU (CHARLES DE SECONDAT, baron de la Brède et de Montesquieu), a French publicist and philosopher, born in the chateau de la Brède, near Bordeaux, Jan. 18, 1689, died in Paris, Feb. 10, 1755. His father and grandfather were presidents of the parliament of Bordeaux, and he himself was destined to the magistracy. He was remarkable in youth for diligent studies not only of jurisprudence but of literature and philosophy, and he afterward declared that books had been to him a sovereign remedy against the ills of life, his troubles having always been dissipated by an hour of reading. Delighted with the authors and philosophers of antiquity, he composed a work at the age of 20 designed to prove that their paganism did not merit eternal damnation, which, however, he refrained from publishing. At the age of 25 he was admitted to the parliament of Bordeaux, of which he became president *à mortier* two years later, succeeding his uncle in that office. He applied himself scrupulously to its duties, though taking little interest in them, understanding, as he confessed, the questions but not the processes, and was chiefly devoted to the pursuits of literature. He was a member of a literary and musical society

formed at Bordeaux in 1716, which through his influence was transformed into an academy of sciences, to which he contributed memoirs chiefly on natural history. The weakness and near-sightedness of his eyes, resulting finally in almost entire blindness, forbade the prosecution of this study. Among his other early writings were dissertations on the physical history of the earth, published in 1719, and on the policy of the Romans in their religion. His first work that attracted general attention was the *Lettres Persanes*, which appeared anonymously in 1721, and has been styled the most profound of frivolous books. It consists of letters represented to have been written by a Persian travelling in France to his friends at home, in which he discusses the manners, government, and events of the times of Louis XIV. and the regency, assailing beneath a transparent veil the whole system of principles prevalent in church and state. It abounds in paradoxes, jests, and sprightly satire, and also in profound views of law, commerce, and social problems; it represents not the popular thought, but the ideas of the best society of the time; and its success was so great as to be almost proverbial. This is the only one of his writings in which he employs the weapon of ridicule, and boldly treats religion and morals. In 1725 he printed the *Temple de Gnide*, a romance of classical antiquity, styled by Mme. Du Deffand the "apocalypse of gallantry," which lacks vigor, and was withdrawn and disowned. In 1726 he retired from the magistracy to devote himself solely to literature; was received into the French academy in 1728, having overcome the opposition of Cardinal Fleury by modifying obnoxious passages in his *Lettres Persanes*; and soon after began to travel through the principal states of Europe to collect materials for an elaborate work on politics and jurisprudence which he had been long meditating. At Vienna he became intimate with Prince Eugene; passed thence through Hungary; at Venice he was acquainted with John Law of Lauriston, living in obscurity after the calamitous delusions of the Mississippi scheme, and with the count of Bonneval, then in the midst of his romantic career; resided next in Rome and Genoa; travelled through Germany to Holland; and sailed thence with Lord Chesterfield to England, where he remained about two years, was received into the royal society, and was treated with distinction by persons of the highest eminence. His residence in England produced a great effect upon his subsequent writings, reconciling him to many features of social order which he had previously assailed. Germany, he said, is made to travel in, Italy to sojourn in, England to think in, and France to live in. He returned to La Brède after an absence of 4 years, and after 2 years of retirement published his *Considérations sur les causes de la grandeur et de la décadence des Romains* (Paris, 1734), the best written of his productions, discussing the period from the foundation of Rome to the conquest of Constantinople by the Turks. Its epigrammatic sen-

tences, confident tone, and oracular judgments on great masses of facts were calculated for the public taste of the time, and contributed to its success. Penetrating to the peculiar genius of the Roman state, he explains its progress as the triumph of tyranny and its decline as the fatality of slavery. His great work, entitled *De l'esprit des lois* (8 vols., 1748), one of the most valuable products of French philosophy in the 18th century, was the mature fruit of all his studies and the result of 20 years of labor. So great was its success that 22 editions were issued in 18 months, and it was translated into most of the European languages. It was read not only by the learned, but by men of the world and ladies, who thought, by perusing its short chapters and entertaining volumes, to attain a solid acquaintance with history and philosophy, legislation and politics, constitutional order and financial science. Laws and governmental theories became fashionable topics of conversation in the Parisian saloons. Voltaire said that "when the human race had lost their charters, Montesquieu found and restored them." The work attracted at first more attention in England than in France or Germany, but soon became the oracle of the friends of moderate freedom, as distinguished from the destructive tendencies of the school of Voltaire and the unhistorical and impracticable tendencies of the followers of Rousseau. It regarded constitutional monarchy, the principle and foundation of which is the sentiment of honor, as the destiny and last refuge of the European races. Montesquieu has from this time held a most prominent place in the philosophy of jurisprudence and politics. He passed the remainder of his life alternately at La Brède and Paris, in his study and in society. The severe labors which he had imposed upon himself in the composition of his principal work had enfeebled his naturally delicate health, and an attack of fever on a visit to Paris terminated fatally. By his own confession, he was one of the happiest of men. With a philosophic repose of character, a perfect equilibrium of faculties and of passions, he passed in ease a quiet and thoughtful life. The piquant and seemingly malicious bon-mots attributed to him were plays of wit and not products of serious feeling. His kindness and beneficence were constantly experienced by the peasants of La Brède and by many other persons. His monument was inaugurated in Bordeaux, Sept. 6, 1858. Among his minor writings are academical discourses; the *Dialogue de Sylla et de Eucrate*, an explanation of the political conduct of Sylla; and an *Essai sur le goût*, written for the *Encyclopédie*. The most complete edition of his works, with the *éloges* by D'Alembert and Villemain, is that by Dalibon (8 vols., Paris, 1827).

MONTEVERDE, CLAUDIO, an Italian composer, born in Cremona about 1565, died in Venice in 1649. He composed both secular and ecclesiastical music, but was particularly celebrated for his motets and madrigals, of the

latter of which he produced 5 books. Among the improvements which he introduced into music was the employment of double discords; and he also was one of the first, if not the first, to give attention to recitative. In his secular productions, by quitting ecclesiastical modulation, he determined the key of each movement, smoothed and phrased the melody, and made all the parts assimilate more naturally and pleasingly than had been done by any of his predecessors. In his 5th book of madrigals he attempted almost every species of discord and modulation.

MONTEVIDEO, the capital of Uruguay, South America, situated on the N. shore of the estuary of the Rio de la Plata, 180 m. E. S. E. from Buenos Ayres, in lat. 34° 58' S., long. 56° 15' W.; pop. 15,000. It is built on a gentle elevation, at the extremity of a small peninsula, and is surrounded by a strong wall, mounted with guns, and further defended by a citadel and batteries. It is tolerably well built, the houses being mostly of one story with flat roofs and brick floors. The streets are broad, regular, and well paved. There are no public buildings worthy of notice, except the cathedral. The bay of Montevideo is about 4 m. long and 2 broad; it has only from 14 to 19 feet of water, but the bottom is soft, and vessels receive no damage by grounding. It is open to the S. S. W. winds. The harbor presents excellent facilities for building wharfs, docks, &c. All vessels receive and discharge their cargoes by means of launches. The trade of Montevideo is very considerable. The exports consist chiefly of salt beef, hides, hair, tallow, wool, bones, bone ashes, &c.; copper is brought overland from Chili and sometimes shipped here, as well as *maté* or Paraguay tea. The principal imports are cottons, woollens, hardware, flour, wine, spirits, sugar, tobacco, salt, boots, &c. The imports from the United States are flour, chairs, refined sugar, whiskey, cordage, agricultural implements, &c., and chiefly lumber from New York, Boston, and Philadelphia. Scarcely a vessel arrives from the United States without having more or less of lumber on board. From Jan. 1 to Oct. 1, 1859, more than 12,000 dozen American chairs were sold at Montevideo, and other American manufactures are also steadily increasing in demand. A large trade in wool, hair, &c., also exists between Montevideo and the United States. The weather, in the winter months of June, July, and August, is at times boisterous, and the air keen and piercing. In summer the heat is oppressive. The climate, however, is represented as being on the whole pleasant and healthful, though moist. The soil in the neighborhood is fertile, and vegetable productions are abundant. Flesh and fish are cheap. Water is scarce, and can only be obtained from wells dug on the sea shore, or by collecting the rain water in cisterns. Montevideo has steam communication with Rio Janeiro, subsidized by the government of Brazil, and with England by British steamers. The differential

duties so long enforced by the government of the Argentine confederation against Montevideo have been removed since Aug. 1, 1859. The U. S. consul, in his official report of Sept. 80, 1859, says: "Montevideo wants nothing but peace to become the commercial emporium of the river Plate. Its natural position, the splendid back country of which it is the capital, and its fine harbor, all point it out as the true commercial centre of the Rio de la Plata."

MONTEZUMA (Mex. *Montequmatin*, the sad or severe man), the name of two emperors of ancient Mexico.—MONTEZUMA I., the greatest of the Mexican monarchs, ascended the throne in 1486 or 1488. Soon after his accession he made war upon the kingdom of Chalco in defence of his allies the Tezucucans. The Chalcos were routed in a great battle, and their chief city was entirely destroyed. A war followed with the king of Tlatelolco, who was defeated and killed. Montezuma next carried his arms to the southward and conquered the province of Cuixhicas, and subsequently that of Tzompahuacan. In a war with Atonaltzin, a chief of the Mixtacas, he suffered reverses which led to a confederacy between Atonaltzin and the Huexotzincas and Tlascalans against the Mexicans; but Montezuma in his first encounter with the allied army gained a signal victory, and greatly enlarged his empire by annexing the territories of the vanquished. In 1457 he conquered Cuexilacatlan, a province on the coast of the Mexican gulf, and carried 6,200 of the people prisoners to Mexico, where they were sacrificed to the god of war. After a successful reign of about 85 years, Montezuma died in 1471.—MONTEZUMA II., the last of the Aztec emperors, born about 1480, succeeded his uncle Ahuitzotl in 1502, and was killed June 30, 1520. He was both a soldier and a priest, and had taken an active part in the wars of his predecessor. As a priest he was distinguished for gravity, reserve, and apparent humility. When his election to the imperial dignity was announced to him, he was employed in sweeping the stairs of the great temple of Mexico. He wept at the address which was made to him by the chief of the deputation to inform him of his elevation, and declared himself unfit for so responsible a station. At the commencement of his reign he displayed energy and enterprise. He led a successful expedition against a rebel province, and brought back a multitude of captives to be sacrificed at his coronation, which was performed with extraordinary pomp. For several years he was constantly engaged in war, and his campaigns, which extended as far as Nicaragua and Honduras, were generally successful. He made important changes in the internal administration of the empire, especially in the courts of justice, and soon became noted for the strictness and severity with which he enforced the execution of the laws. He was also distinguished for munificence to those who served him, and in his expenditures for the embellishment of the capital by the construction

of temples, aqueducts, and other public works. He became equally noted also for arrogance and for the pomp and luxury in which he lived. His profuse expenditures required additional and heavy taxes upon the people, which led to many revolts; and during the latter part of his reign the forces of one half of the empire were constantly occupied in suppressing the commotions of the other. At the time of the arrival of Cortes in Mexico in 1519, Montezuma was agitated and alarmed not only by the internal troubles of his empire, but by the appearance of several comets, of other strange lights in the sky, and of mysterious fires in the great temple, which the astrologers and seers of Mexico interpreted as omens of the approaching downfall of the empire. Disheartened by these presages, he did not meet the invasion of the Spaniards with his usual energy. He temporized and wavered, at first forbidding the white men to approach his capital, and then sending an embassy to welcome them. Cortes entered Mexico Nov. 8, 1519, and was received by Montezuma at last with courtesy and apparent good will. His personal appearance at their first interview is thus described by Prescott: "Montezuma wore the girdle and ample square cloak, *tilmatli*, of his nation. It was made of the finest cotton, with the embroidered ends gathered in a knot round his neck. His feet were defended by sandals having soles of gold, and the leathern strings which bound them to his ankles were embossed with the same metal. Both the cloak and sandals were sprinkled with pearls and precious stones, among which the emerald and the *chalchivuil*—a green stone of higher estimation than any other among the Aztecs—were conspicuous. On his head he wore no other ornament than a *panache* of plumes of the royal green, which floated down his back, the badge of military rather than of regal rank. He was at this time about 40 years of age. His person was tall and thin, but not ill made. His hair, which was black and straight, was not very long; to wear it short was considered unbecoming persons of rank. His beard was thin, his complexion somewhat paler than is often found in his dusky, or rather copper-colored race. His features, though serious in their expression, did not wear the look of melancholy, indeed of dejection, which characterizes his portrait, and which may well have settled on them at a later period. He moved with dignity, and his whole demeanor, tempered by an expression of benignity not to have been anticipated from the reports circulated of his character, was worthy of a great prince. Such is the portrait left to us of the celebrated Indian emperor, in this his first interview with the white men." Cortes at first treated the emperor with the greatest deference, but a collision between the Mexicans and a Spanish garrison at Vera Cruz soon afforded him a welcome pretext for a change of measures. At the end of a week after his arrival in Mexico, he waited upon Montezuma with a few of his officers under pretence of a friendly visit, and, after upbraid-

ing him with the transactions at Vera Cruz, took him captive in his own palace and carried him to the Spanish head-quarters. The terrified emperor, fearing instant death if he made any opposition, assured his astonished subjects, who were about to attempt a rescue as he passed through the streets in custody of the strangers, that he accompanied the Spaniards of his own free will. Shortly after his arrest, Montezuma was for a while put in irons, and was so completely humbled by the treatment he received that when Cortes, deeming his spirit sufficiently broken, offered to liberate him, he declined to return to his palace, apparently ashamed to be seen by his nobles. He was subsequently induced to swear allegiance to the king of Spain, and was kept a prisoner for 7 months, till in June, 1520, the people of the capital rose in insurrection and besieged the Spaniards in their quarters. He was induced by Cortes to address his subjects from the battlements of his prison in hopes of appeasing the tumult; but though at first listened to with respect, his appeals in behalf of the white men at length exasperated the Mexicans, and a shower of missiles was discharged at him, one of which, a stone, struck him on the temple with such force that he fell senseless. The unhappy monarch, more affected by the degradation of his situation than by the wound itself, never recovered from this blow. He refused all remedies, tore off the bandages as often as they were applied, rejected all nourishment, and died in a few days. "The tidings of his death," says the chronicler Bernal Diaz, "were received with real grief by every cavalier and soldier in the army who had had access to his person; for we all loved him as a father—and no wonder, seeing how good he was." Some of the children of Montezuma became Christians, and were carried to Spain, and from them were descended the counts of Montezuma, one of whom was viceroy of Mexico from 1697 to 1701.

MONTFAUCON, BERNARD DE, a French Benedictine monk, born in Soulague, Languedoc, Jan. 17, 1655, died Dec. 19, 1741. After completing his education at the college of Limoux, he served in two campaigns in Germany under Turenne. Grief for the sudden death of his parents induced him, in 1675, to enter a Benedictine convent at Toulouse. Afterward he went to Paris, where he became a member of the congregation of St. Maur, and acquired a high reputation for his scholarly attainments. In 1719 he was made a member of the academy of inscriptions. His most important works are: *Palaeographia Græca, sive de Ortu et Progressu Literarum Græcarum* (fol., Paris, 1708); *L'antiquité expliquée et représentée en figures* (in French and Latin, 10 vols. fol., 1719); and *Les monuments de la monarchie Française* (in French and Latin, 5 vols. fol., 1729-'88). He also published valuable editions of the works of several of the Greek fathers.

MONTFERRAT, a territory of Sardinia, formerly an independent duchy, between Milan, Piedmont, and Genoa, and separated by a strip

of Milanese territory into the divisions of Casale on the N. and Acqui on the S., Casale being the capital. It often changed masters, and was for more than a century in the hands of the dukes of Mantua; but in 1708 it was bestowed by the emperor Leopold I. upon the duke of Savoy, a possession of whose house it has since remained. The family of Montferrat was of remote origin, and very conspicuous in the middle ages.

MONTFORT, JEAN (IV.) DE, duke of Brittany, born in 1298, died in Hennebont, Sept. 26, 1845. He was the son of Duke Arthur II., and succeeded his brother Jean III. in 1341. The latter had bequeathed the duchy to Charles of Blois, the husband of his niece; but Montfort found little difficulty in getting possession, and Charles complained to the king, Philip of Valois, who sent an army under his son the duke of Normandy to besiege the usurper in Nantes. In order to spare the city from assault, Montfort surrendered and was carried prisoner to Paris; but in the mean time his wife, Jeanne of Flanders, put herself at the head of his partisans and withdrew to Hennebont, where she defended herself heroically against the forces of Charles, on one occasion repelling a furious assault in person at the head of 800 cavaliers. The arrival of auxiliaries sent by Edward III. of England, to whom Montfort had done homage for Brittany, obliged Charles to raise the siege. A second attempt upon the same city in 1343 was equally unsuccessful, and Charles soon lost successively Guérande, Vannes, Carhaix, and Quimperlé. In the same year Edward III. arrived in France with fresh troops and advanced to Rennes, where Philip marched out to meet him. It seemed likely that the quarrel for a single duchy would become a war between two kingdoms, when by the mediation of the pope a truce was concluded between the monarchs, and the Bretons were left to fight out their own battles. Montfort's party, which before was barely a match for his rival's, had grown during his imprisonment, and Philip still further increased it by putting to death 15 Breton nobles whom he believed to have favored the English. Montfort himself escaped in disguise in 1345, and went to England, whence he soon returned with troops and made an unsuccessful attempt upon Quimper. He then retired to Hennebont, where he died a few weeks afterward, leaving a son who continued the war with Charles, and became duke as Jean V.

MONTFORT. I. SIMON DE, a French soldier, born about the middle of the 12th century, slain in 1218. He early distinguished himself by piety, physical strength, and valor. He engaged in the 4th crusade, under Baldwin of Flanders and the marquis of Montferrat; but when he saw the enterprise diverted from its legitimate object, he declined to follow its chiefs to Constantinople, and to fulfil his vows went by himself to Palestine. On his return home he took up arms again at the summons of Pope Innocent III., and in 1208 was elected the leader of the holy war waged against the Albigenses of

southern France, whom he mercilessly pursued and slaughtered. On the taking of Béziers, no fewer than 15,000 of its inhabitants were put to death by his permission, if not by his orders. Carcassonne was scarcely better treated; the viscount of Béziers, who commanded there, was made prisoner in an interview for negotiation; the town was consequently forced to surrender, and many of its citizens were sentenced to death as heretics. At Lavaur, Aimery of Montreal was hanged, 80 knights were put to the sword, hundreds of poor people burned at the stake, and the lady of the castle, Aimery's sister, was thrown alive down a well, and stones were heaped over her. Montfort ruled despotically over the territories which he had wrested from Count Raymond of Toulouse in this war; and when Don Pedro II., king of Aragon, came to protect the latter, as his lord paramount, the crusader met him, Sept. 12, 1213, and defeated him under the walls of Muret; the unfortunate prince was killed during the battle by several knights who had conspired to take his life. Montfort was proclaimed count of Toulouse, and retained his usurped honors for several years. Raymond's son finally managed to reënter Toulouse, where he had many adherents; Montfort besieged that city with all his forces, but met with unexpected resistance. At the end of 8 months, when attempting to storm it, he was killed on the spot by a large stone thrown by machinery from the wall. His elder son, Amaury, succeeded him as count of Toulouse, afterward exchanged this title for the dignity of grand constable of France, and died in 1241 on his return from Palestine. II. SIMON DE, earl of Leicester, younger son of the preceding, the leader of the English barons in the reign of Henry III., born about the end of the 12th century, killed Aug. 4, 1265. Having gone to England to escape the enmity of Blanche of Castile, queen regent of France, he gained the favor of the king, who bestowed upon him the earldom of Leicester, the governorship of Gascony, and the hand of his own sister Eleanor, countess dowager of Pembroke. He governed Gascony with an iron hand, and made his power particularly felt by the native lords, but was popular with the English. This gave him considerable influence in his adopted country, where he played a conspicuous part in the political troubles that followed. He became the head of the barons who conspired to curtail the king's prerogative. Henry III. having in 1258 convoked a parliament, he appeared in arms with his confederates, and constrained the king to sign those remarkable regulations called the provisions of Oxford, by which the whole legislative and executive power was thrown into the hands of 24 barons, who were in fact controlled by Montfort. An agreement was proposed between the nobles and the king through the arbitration of Louis IX. of France; but the award of this prince not being acceptable to the former, both parties took arms. In May, 1264, Leicester met the royal army at Lewes in Sussex, and a fierce

engagement terminated in its total defeat and the capture of the king. In Jan. 1265, he summoned a parliament, in which, for the first time on record, representatives of boroughs were admitted. His power was now at its height; but his overbearing conduct excited discontent even among the adherents of the national cause; and the king's son, Prince Edward, who was kept as a hostage, having made his escape, many of his former opponents joined his standard. Leicester now vainly attempted resistance; he was hemmed in at Evesham by superior numbers; he fought with the courage of despair, but was slain with one of his sons and many barons, while his army was completely routed. The family of Montfort was expelled from England. Notwithstanding his faults, he had founded his popularity on so solid a basis, that it outlived his overthrow and death; although under sentence of excommunication, he was almost honored as a saint, and miracles were reported to be wrought at his tomb.

MONTGOLFIER. See AEROSTATION.

MONTGOMERIE, ARCHIBALD WILLIAM. See EGLINTON AND WINTON, earl of.

MONTGOMERY, the name of counties in 16 of the United States. I. An E. co. of N. Y., intersected by the Mohawk river, which is here joined by the Schoharie river and other smaller streams; area, 856 sq. m.; pop. in 1855, 30,808. It has a fertile soil, especially in the valley of the Mohawk. The productions in 1855 were 42,888 bushels of wheat, 997,605 of oats, 247,516 of Indian corn, and 84,582 tons of hay. There were 48 saw mills, 24 grist mills, 15 tanneries, 5 newspaper offices, 118 school houses, and 52 churches. The Erie canal and the New York central railroad pass through the county. Capital, Fonda. II. A S. E. co. of Penn., bounded S. W. by the Schuylkill river; area, 450 sq. m.; pop. in 1850, 53,291. The surface is undulating, and the soil is rich, especially along the Schuylkill. The productions in 1850 were 878,244 bushels of Indian corn, 309,255 of wheat, 699,824 of oats, 238,924 of potatoes, 98,701 tons of hay, and 3,048,089 lbs. of butter. There were 117 flour and grist mills, 37 lime kilns, 21 iron mines, 16 manufactories of cabinet ware, 9 of farming implements, 16 brick yards, 11 cotton factories, 7 woollen factories, 4 iron furnaces, 4 forges, 8 powder mills, 2 rolling mills, 16 linseed oil mills, 19 tanneries, 95 churches, 6 newspaper offices, and 9,998 pupils attending public schools. Limestone and marble are found in the S. E., and iron, lead, and copper in the W. The Philadelphia and Norristown, the Chester Valley, and the Philadelphia, Easton, and Water Gap railroads pass through the county. Capital, Norristown. III. A central co. of Md., bounded N. E. by the Patuxent and S. W. by the Potomac river; area, 440 sq. m.; pop. in 1850, 15,850, of whom 5,114 were slaves. The surface is moderately uneven; the soil is fertile along the banks of the rivers. The productions in 1850 were 396,947 bushels of Indian corn, 164,108 of wheat,

168,240 of oats, 8,588 tons of hay, and 426,995 lbs. of tobacco. There were 4 woollen factories, 31 grist mills, 37 churches, 1 newspaper office, and 750 pupils attending public schools. The Chesapeake and Ohio canal passes along the S. W. border. Capital, Rockville. IV. A S. W. co. of Va., bounded W. by New river, and drained by the head waters of Staunton river; area, 490 sq. m.; pop. in 1850, 8,359, of whom 1,471 were slaves. The surface is mountainous, and the soil generally rocky, but productive near the rivers. The productions in 1850 were 266,616 bushels of Indian corn, 51,827 of wheat, 106,120 of oats, and 4,458 tons of hay. There were 4 saw mills, 5 tanneries, 12 churches, and 850 pupils attending public schools. Value of real estate in 1856, \$2,650,812, showing an increase of 80 per cent. since 1850. The Virginia and Tennessee railroad passes through the county. Capital, Christiansburg. V. A S. co. of N. C., bounded W. by Yadkin river and drained by its branches; area, 500 sq. m.; pop. in 1850, 6,872, of whom 1,773 were slaves. The surface of the W. part is hilly; much of the soil is fertile. In 1850 this county produced 192,191 bushels of Indian corn and 1,456 bales of cotton. There were 2 cotton factories, 8 saw mills, 6 churches, and 1,022 pupils attending public schools. Capital, Lawrenceville. VI. A S. E. co. of Ga., bounded N. E. by Pendleton's river, S. by the Altamaha, and S. W. by the Little Ocmulgee, and intersected by the Oconee; area, 624 sq. m.; pop. in 1859, 2,843, of whom 984 were slaves. The surface is level and the soil sandy. The productions in 1850 were 55,365 bushels of Indian corn, 28,710 of sweet potatoes, and 292 bales of cotton. There were 13 churches, and 200 pupils attending public schools. Capital, Mount Vernon. VII. A S. E. co. of Ala., bounded N. W. by the Coosa and Alabama rivers, and intersected in the N. by the Tallapoosa; area, 900 sq. m.; pop. in 1850, 29,795, of whom 19,511 were slaves. The surface is uneven, and the soil generally fertile. The productions in 1850 were 1,265,645 bushels of Indian corn, 298,488 of sweet potatoes, 191,853 of oats, 156,539 lbs. of rice, and 25,826 bales of cotton. There were 20 churches, 10 newspaper offices, and 866 pupils attending public schools. The Montgomery and West Point railroad passes through Montgomery, the capital of the county and of the state. VIII. An E. co. of Texas, drained by San Jacinto river and its tributaries; area, 852 sq. m.; pop. in 1858, 3,946, of whom 1,947 were slaves. It has a rolling surface with an abundance of good timber, and the soil, with the exception of some sandy pine barrens, is fertile. The productions in 1850 were 80,441 bushels of Indian corn, 1,109 bales of cotton, and 39,720 lbs. of butter. There were 3 churches, and 75 pupils attending schools. Value of land in 1859, \$715,392. Capital, Montgomery. IX. A W. co. of Ark., drained by Washita river and its branches; area, 1,050 sq. m.; pop. in 1854, 2,172, of whom 62 were slaves. The surface is mostly moun-

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tainous. The productions in 1854 were 108,903 bushels of Indian corn, 5,523 of wheat, 8,867 of oats, and 186 bales of cotton. The county contains excellent slate. Capital, Mount Ida. X. A N. W. co. of Tenn., bordering on Kentucky, and drained by Cumberland river and its branches; area, 500 sq. m.; pop. in 1850, 21,945, of whom 9,071 were slaves. It has a rolling surface and a good soil. The productions in 1850 were 1,077,304 bushels of Indian corn, 153,179 of oats, 43,807 of wheat, 3,454,745 lbs. of tobacco, and 155,129 of butter. There were 27 churches, 4 newspaper offices, and 343 pupils attending schools. Capital, Clarksville. XI. A N. E. co. of Ky., bounded S. in part by Red river; area, 275 sq. m.; pop. in 1850, 9,903, of whom 3,073 were slaves. The surface is hilly and mountainous, and most of the soil very fertile. The productions in 1850 were 914,863 bushels of Indian corn, 97,974 of oats, 106 tons of hemp, 4,410 lbs. of tobacco, and 35,302 of wool. There were 12 grist mills, 1 newspaper office, 19 churches, and 558 pupils attending public schools. Capital, Mount Sterling. XII. A S. W. co. of Ohio, drained by Miami river and its branches; area, 480 sq. m.; pop. in 1850, 38,218. The surface is undulating, and the soil generally fertile and well cultivated. Trenton limestone is abundant. The productions in 1850 were 815,769 bushels of wheat, 1,273,932 of Indian corn, 198,893 of oats, and 12,801 tons of hay. There were 60 churches, 10 newspaper offices, and 13,828 pupils attending public schools. The Miami canal passes through the county, and several railroads terminate at Dayton, the capital. XIII. A W. co. of Ind., drained by Sugar, Big and Little Raccoon creeks; area, 504 sq. m.; pop. in 1850, 18,084. The surface is level or undulating, and the soil is generally good. The productions in 1850 were 1,392,404 bushels of Indian corn, 121,988 of wheat, 99,083 of oats, 10,714 tons of hay, and 85,288 lbs. of wool. There were 19 saw mills, 24 grist mills, 48 churches, 2 newspaper offices, and 1,880 pupils attending schools. The New Albany and Salem railroad passes through Crawfordsville, the capital. XIV. A S. W. co. of Ill., drained by Shoal creek and its branches, and the head waters of the Macoupin creek; area, 544 sq. m.; pop. in 1855, 9,041. It has a diversified surface, partly covered with forests, and a rich soil. The productions in 1850 were 452,885 bushels of Indian corn, 98,412 of oats, 21,425 of wheat, and 18,858 lbs. of wool. There were 25 grist mills, 12 churches, and 1,668 pupils attending public schools. The Alton and Terre Haute railroad passes through Hillsborough, the capital. XV. An E. co. of Mo., bounded S. by the Missouri river and drained by Au Cuivre and Lautre creeks; area, 576 sq. m.; pop. in 1856, 7,263, of whom 1,245 were slaves. The surface is hilly in the region of the river, and in other parts undulating; the soil is of various qualities. Limestone, iron ore, and coal are found. The productions in

1850 were 344,721 bushels of Indian corn, 21,170 of wheat, 74,958 of oats, 1,009 tons of hay, 20,696 lbs. of wool, and 353,865 of tobacco. There were 9 churches, and 692 pupils attending public schools. Capital, Danville. XVI. A S. W. co. of Iowa, drained by Nishnabotona and West Nodaway rivers, tributaries of the Missouri; area, 432 sq. m.; pop. in 1859, 1,094. The surface is undulating and the soil fertile. The productions in 1859 were 66,455 bushels of Indian corn, 1,112 of wheat, 4,488 of potatoes, and 19,887 lbs. of butter. Capital, Frankford.

MONTGOMERY, a city of Montgomery co., Ala., and capital of the state and county, situated on a high bluff on the left bank of the Alabama river, 415 m. above Mobile; pop. in 1850, 4,935; in 1858 estimated at 7,000, and in 1860 at 10,000. In addition to the state house, gaol, and various public offices, it has 6 churches, several seminaries, the law department of the university of Alabama, 4 daily newspaper offices, 2 banks, and several marble yards, iron foundries, and saw mills, and is largely engaged in the shipment of cotton. The river is navigable by steamboats to this point at all seasons of the year. The Alabama and Florida railroad connects the city with Pittston, and when completed will extend to Pensacola; and the Montgomery and West Point railroad, which now (1860) has its W. terminus at Montgomery, is to be prolonged by means of connecting lines to the Mississippi. Montgomery was laid out in 1817, and the seat of government was removed to it from Tuscaloosa in 1846.

MONTGOMERY, COUNTESS. See BAUER, KAROLINE.

MONTGOMERY, JAMES, a British poet, born in Irvine, Ayrshire, Nov. 4, 1771, died near Sheffield, April 30, 1854. His father was a Moravian preacher, and James, being intended for the same office, was sent in his 7th year from Ireland, whither his father had removed, to a Moravian settlement at Fulneck, near Leeds, Yorkshire, to complete his education. Here he remained for 10 years, undistinguished except for indolence and melancholy. At the end of that period, his parents being now dead, the brethren at Fulneck apprenticed him to a grocer in Mirfield. He was already a writer of verses, a love of poetry having been awakened in him by hearing Blair's "Grave" read aloud; and before the age of 14 he had written a mock heroic poem of 1,000 lines, and had commenced an epic to be called "The World." The servitude of a grocer's shop becoming irksome to him, he ran away in June, 1789, with 8s. 6d. in his pocket; but after many wanderings he engaged again as shop boy in Wath, a village of Yorkshire. When he had been in this place a year he sent a volume of manuscript poetry to Mr. Harrison, a London publisher, and soon after went there himself. Mr. Harrison refused his poems, but engaged him as his shopman. In London he led the same recluse life as in the country; writing was his only amusement, and

in 1792 his first publication, a tale, appeared in an Edinburgh periodical. But he soon tired of London, and returned to Wath, where however he remained only for a short time. Toward the end of 1792 he became clerk to Mr. Joseph Gales of Sheffield, editor and publisher of the "Sheffield Register," a newspaper accused of revolutionary tendencies. He wrote political articles, and when Gales, learning that a warrant had been issued against him for treason, fled to America, Montgomery started a new weekly journal called the "Sheffield Iris," advocating peace and reform principles. The first number appeared July 4, 1794, and he continued to edit it till Sept. 27, 1825, when on his retirement a public banquet was given him by his townsmen. Almost immediately after the first appearance of the "Iris," he was indicted, tried, and fined £20, and sentenced to 3 months' imprisonment, for printing a doggerel ballad on "The Fall of the Bastille" for a poor hawk. Again in 1796 he was found guilty of sedition, fined £30, and sentenced to 6 months' imprisonment, for publishing in his newspaper an account of a riot in Sheffield, to quell which the military had been called out and had fired on the people. He was confined in York castle, where he wrote a small volume of poems entitled "Prison Amusements," published in 1797. His gentle, yet earnest character, and his literary ability, now began to be recognized, and won him the regard of his political opponents. Many short poems appeared in the "Iris," and he began to take a high rank as a sacred poet. In 1806 he published "The Wanderer in Switzerland," which soon reached a 3d edition. "The West Indies," a descriptive poem, commemorative of the abolition of the slave trade, appeared in 1809. Soon after he published "The World before the Flood," and "Greenland," celebrating the efforts of the Moravian missionaries in that country. The former poem attained great popularity. In 1827 appeared "The Pelican Island and other Poems." A collected edition of his works was called for in 1836, and again in 1849 and in 1851. In 1858 "Original Hymns for Public, Private, and Social Devotion" concluded the series of his poetical works. His prose works are: "Prose by a Poet," being two volumes of sketches, and a "History of Missionary Enterprise in the South Seas." He delivered in 1830 a course of lectures on the "History of English Literature," and in 1852 a lecture "On some Passages of English Poetry but little known." In 1835 he declined the office of professor of rhetoric in the university of Edinburgh, and in the same year a pension of £150 was bestowed on him by the queen. Though he was a politician and journalist, and the larger part of his poetry is hardly religious, yet he is best known by that in which he succeeded best, his sacred hymns. They have a pure, affecting, and often profound religious spirit. His style is considered a model of clearness and simplicity. In politics he was a liberal whig, and an ardent slavery abolitionist, and in his manhood

reunited himself with the Moravians. Memoirs of his life and writings, with extracts from his correspondence and journals (7 vols. 8vo., 1855-'6), have been published by two of his friends, John Holland and James Everett. A complete edition of his poetical works appeared in 1855 (4 vols. 12mo., London).

MONTGOMERY, RICHARD, an American revolutionary general, born at Convoy House, near Raphoe, Ireland, Dec. 2, 1786, killed in the attack on Quebec, Dec. 31, 1775. At the age of 18 he obtained a commission in the British army, in 1757 commenced his career of active service in America, and at the siege of Louisburg in 1758 and elsewhere gave evidence of high military capacity. He distinguished himself in the expeditions against Martinique and Havana, and in 1768 obtained permission to revisit Europe, where he remained during the next 9 years. He then sold out his commission, and, emigrating to New York, married a daughter of Judge Robert R. Livingston, and in 1778 settled in Rhinebeck, Dutchess co. In 1775 he represented Dutchess co. in the provincial congress, and later in the same year was appointed one of the 8 brigadiers to serve in the newly organized army of the united colonies. The office, which had been neither expected nor desired by him, was accepted on the ground that "the will of an oppressed people, compelled to choose between liberty and slavery, must be obeyed." He was immediately attached, as senior brigadier, to the larger of the two divisions sent to Canada in the summer of 1775, and in the early part of September found himself before the fortress of St. John's. The illness of Gen. Schuyler having caused his return to Albany, Montgomery assumed the command of the division, and by a series of well directed movements successively acquired possession of Chambly, St. John's, and Montreal, thereby becoming in the middle of November master of a great part of Canada. Effecting a junction on Dec. 4 with Arnold's troops, then recently arrived, he immediately proceeded to take a position before Quebec. At a council of officers it was determined to attempt to capture the place by a *coup de main*, and two attacks of this character were projected, the one on the lower town from the suburbs of St. Roque, and the other on the upper at the Cape Diamond bastion, "to be executed in the night and when the weather should be favorable." Accordingly, on Dec. 31, at 2 A. M., the storming columns commenced their march amid a heavy fall of snow, which considerably impeded their movements. Montgomery, who headed the attack on the Cape Diamond bastion, reached with difficulty the first barrier, which was rapidly carried. Pausing a moment to encourage his men, he pressed eagerly on to the second barrier, and with his two aids fell dead at the first and only discharge by the British artillerymen, who immediately took to flight. His men, panic-stricken by the loss of their leader, com-

menced a disorderly retreat, and the assault on the city ended in failure. He was interred within the city walls. His death was considered a severe loss to the American cause, and congress testified "their grateful remembrance, profound respect, and high veneration" for him, by erecting a monument to his memory in the front of St. Paul's church, New York. In 1818 the state of New York caused his remains to be removed and placed beneath the monument.

MONTGOMERY, ROBERT, an English poet and clergyman, born in Bath in 1807, died in Brighton, Dec. 8, 1855. He was the son of a theatrical clown named Gomery, but always assumed the more dignified name in his literary works. At an early age he was conducting a weekly publication, called "The Inspector," in his native city. In 1827 he published "The Stage Coach," and in the same year a volume entitled "The Age Reviewed, a Satire." The tone of this poem was religious, and all his subsequent efforts were in the same vein. His next publication, "The Omnipresence of the Deity" (1828), was the most popular of his poems, 8 editions being sold in as many months; and in 1857 it had reached the 26th edition. It was on the appearance of the 11th edition of this work in 1830, that Macaulay wrote a famous criticism upon it in the "Edinburgh Review," charging the poet with plagiarism and every grammatical and rhetorical sin, and ascribing its popularity to a well planned system of puffing. In 1828 he also published a volume containing "A Universal Prayer, Death, a Vision of Heaven, and a Vision of Hell." His next production was "Satan," which procured for him the popular sobriquet of "Satan" Montgomery. In 1830 he entered Lincoln college, Oxford, with the intention of preparing himself for the ministry; and in 1831 he published "Oxford," a semi-historical poem, with notes and illustrations, which gained him however only ridicule among the members of the university. In 1832 he published "The Messiah, a Poem, in Six Books," and in 1833 "Woman, the Angel of Life." In 1835 he was ordained, and his first curacy was Whittington in Shropshire. In May, 1836, he became minister of Percy street chapel, London, whence in 1838 he went to St. Jude's chapel, Glasgow. Here his preaching being attended with much controversy, he resigned and returned to London in 1842. Immediately on his arrival he published "Luther, or the Spirit of Toleration;" and in the next year resumed his ministry at Percy street chapel, where he continued until his death. From 1843 to 1854 he issued a number of theological works, and a series of "Meditations" upon Scripture subjects; "Sacred Meditations and Moral Themes;" "The Christian Life, a Manual of Sacred Verse;" "Lyra Christiana—Poems on Christianity and the Church;" "Lines on Wellington," and "The Hero's Funeral," in 1852; and "The Sanctuary, a Companion in Verse for the English Prayer Book."

MONTGOMERYSHIRE, a county of Wales, bounded N. by Denbighshire, E. by Shropshire, S. by Radnorshire, S. W. by Cardiganshire, and W. and N. W. by Merionethshire; area, 755 sq. m.; pop. in 1851, 67,385. It belongs almost entirely to the basin of the Severn, which traverses its whole extent. The principal mountains are Plinlimmon, the Breiddin hills, and Llandinam, which is 1,895 feet high. The chief rivers, beside the Severn, are the Vyrnwy, Wye, and Dovey. The soil of the low country is in general fertile. In the districts bordering on England agriculture has made considerable progress. Copper, zinc, coal, and limestone are mined. The staple manufactures are flannels, and a species of cotton called "Welsh plains." Montgomeryshire sends two members to parliament, one for the county and one for 6 united boroughs. Capital, Montgomery.

MONTH (Sax. *mona*, the moon), a period of time defined, according to the derivation of the word, by one revolution of the moon around the earth, and hence equal to 29 days, 12 hours, 44 minutes, and 3 seconds. This division of time, now known as the lunar month, was used by the Chaldeans and Egyptians, and is still by the Jews, Turks, and many uncivilized nations, as the most distinctly marked period of the year. But if the year be made to comprise 12 of these months, the seasons will soon be found to fall back from those months to which they originally belonged, so that in 34 years the change would be complete from summer to winter. The period of a month has consequently been changed to the 12th part of the solar year, and comprises an average length of 30 days, 10 hours, and 30 minutes. This is called the solar month. But the calendar months are not equal divisions of the year, some (April, June, September, and November) consisting of 30, and the remainder of 31 days, except February, to which a period of only 28 days is assigned, with the addition every 4th year of one more day. These distinctions often give rise to much confusion as to the time intended to be designated by a month. In popular language it is often understood to be 4 weeks, as this is very nearly an equal period, expressed in the division by weeks, to the month. This is even laid down by Blackstone as the legal definition of the term, so that a lease for 12 months is only for 48 weeks; but the expression "a twelvemonth" has been legally held to mean a solar year.

MONTHOLON, CHARLES TRISTAN DE, count of Lee, a French soldier, born in Paris in 1788, died in Aug. 1853. He belonged to an ancient family, entered the naval service when 10 years old, but soon left it, and in 1797 became a non-commissioned officer in a regiment of cavalry. By his bravery and good conduct, in less than 2 years he reached the rank of *chef d'escadron*. In this capacity he evinced great zeal in behalf of Bonaparte on the 18th Brumaire, after which he was officially attached to the first consul's staff, and gained promotion by his valor during the campaigns in Italy, Germany, and

Poland, especially distinguishing himself, as aide-de-camp to Berthier, in the battle of Wagram, where he received 5 wounds. In 1809 he was appointed chamberlain to the emperor, was intrusted with several diplomatic missions, which he discharged with tact and ability, and was made a brigadier-general in 1814. The fall of Napoleon afflicted him greatly; he pleaded in vain to accompany the emperor to Elba, was among the foremost to join him on his return in 1815, acted as his aide-de-camp during the Hundred Days, fought for him to the last, and on his second abdication obtained permission to follow him to St. Helena, where he devoted himself to his personal service. He witnessed his death, was appointed one of his executors, and returning to Europe, published in conjunction with Gen. Gourgaud a series of papers written under Napoleon's dictation: *Mémoires pour servir à l'histoire de France sous Napoléon, écrits à Ste. Hélène sous sa dictée* (8 vols. 8vo., Paris, 1828). His fortune having been ruined by his protracted absence, he tried to retrieve it by commercial enterprise, but failed, and became involved in debt. He accompanied Prince Louis Napoleon in his unsuccessful attempt at Boulogne in 1840, and was sentenced to share his imprisonment at Ham, but at the end of a few years received a pardon. While in prison he wrote *Histoire de la captivité de Ste. Hélène* (Paris, 1846). After the revolution of 1848 he became a member of the legislative assembly, and lived long enough to see Louis Napoleon, to whose fortunes he was as enthusiastically devoted as he had been to those of his uncle, ascend the imperial throne.—His son, the marquis of Montholon, who has married a lady of Virginia, is now (1860) French consul-general in New York.

MONTHYON, or **MONTYON**, ANTOINE JEAN BAPTISTE ROBERT AUGET, baron de, a French philanthropist, born in Paris, Dec. 28 or 26, 1738, died there, Dec. 26, 1820. He was successively intendant of the provinces of Provence, Auvergne, and Aunis, and as member of the royal council opposed the unlawful proceedings resorted to in the case of Lachalotais, and protested against the dissolution of ancient parliaments decreed by Chancellor Maupeou. In consequence of this latter act he was deprived of his office. Soon after the accession of Louis XVI. he was appointed councillor of state, became in 1780 chancellor of the count d'Artois (afterward Charles X.), emigrated to England on the breaking out of the French revolution, and did not return to France until the second restoration. He possessed a princely fortune, and devoted the larger portion not of his income only, but of his capital, to philanthropic purposes. He generously assisted his exiled countrymen, and bequeathed to French hospitals over 3,000,000 francs. As early as 1782 he had founded a prize for virtue and several other prizes, to be awarded by the French academy and the academy of sciences. These, having been suppressed by order of the convention, were renewed by the donor on his return to France in 1816,

and afterward increased. Every year the French academy distributes two Monthyon prizes of 10,000 francs each: one to the poor person who has performed the most meritorious deed of virtue; the other to the author of the work which has been judged the most useful for the improvement of public morals. Two others of equal amount are awarded by the academy of sciences: one to him who shall have found during the year some means of improvement of the medical and surgical art; the other to him who shall have discovered the means of rendering some mechanical art less unhealthy. Monthyon wrote an *Eloge du chancelier de l'Hôpital* (1777); *Recherches et considérations sur la population de la France* (1778); an essay on the influence of the discovery of America upon Europe, which won a prize at the French academy; *Quelle influence ont les diverses espèces d'impôts sur la moralité, l'activité et l'industrie des peuples?* (1808); *Les ministres des finances en France de 1660 à 1791* (London, 1812); *État actuel du Tonkin* (London, 1812), &c. A poem in his honor by Alfred de Wailly (1826), and a prose essay by L. Fougère (1834), were crowned by the French academy in 1834.

MONTI, VINCENZO, an Italian poet, born in Fusignano, near Ferrara, Feb. 19, 1754, died in Milan, Oct. 18, 1828. He was originally destined by his father to the career of an agriculturist; but while at the seminary of Faenza he displayed such aptitude for study and love of literature that he was sent to the university of Ferrara. He aimed at no profession, but read with enthusiasm the Latin and Italian poets, and before his 16th year published Latin elegies and an Italian poem on the prophecy of Jacob. The influence of Dante, whom he made his model, appears in the sublime imagery of his "Vision of Ezekiel," written 2 years later. His occasional verses attracted the attention of Cardinal Borghese, who conducted him to Rome, where he was associated with the most eminent men, and appointed secretary to Braschi, nephew of Pope Pius VI. Assuming the clerical habit, he was called the abbate Monti, though he never took orders. He recited and published several poems with applause, and was received into the academy of Arcadians, with the principal members of which he was soon at war on account of his satires and impatience of criticism. Alfieri was at this time gaining his first successes in tragedy, several of his plays having been privately performed. Monti attempted to rival the excellence of his *Virginia* by producing a drama entitled *Aristodemus*, in which he aimed to combine the vigor of Alfieri with greater smoothness and elegance. It was favorably received, though severely criticized for its slight action and its horrible plot. A second dramatic attempt, *Galeotto Manfredi*, in which he violates his own principles of classicality, proved a failure. The assassination of the French revolutionary ambassador Basseville in the streets of Rome was the occasion of his next production.

He was selected by members of the pontifical government to celebrate this event in a poem conformed to their political views, and published in 15 days his *Basilianus*, in a style more truly Dantesque than any thing that had been written for centuries. The angel of the Lord and the enemy of mankind contend for the soul of the murdered republican, which, though finally saved, is doomed for a period to hover on the banks of the Seine and to witness the atrocities of the reign of terror. It was the first effective expression of the horror of monarchical and Catholic Europe at the French revolution. The first edition of his mythological poem *Musogonia* (1796) was agreeable to the papal government; but he afterward embraced the hopes of national revival offered by Bonaparte, whom he made the hero of the second edition (1798), and also of a still finer poem entitled *Prometeo*. He was successively secretary of the directory of the Cisalpine republic and commissary in the Romagna; and Bonaparte, having listened at a private entertainment to one of his poems in honor of revolutionary liberty, pronounced him one of the greatest of Italian geniuses. He fled to France on the Austro-Russian invasion in 1799, but returned to Milan after the battle of Marengo, and published the tragedy of *Caio Graccho*, and a poem on the death of his friend the mathematician Mascheroni. Appointed professor of belles-lettres in the college of Milan, he was immediately afterward promoted to the chair of rhetoric in the university of Pavia. He celebrated the coronation of Napoleon as king of Italy (1805) in the poem of *Il beneficio*, the triumph of Jena in an ode on the *Spada di Federico*, the usurpation of the Spanish throne in the *Palingenesi*, the second marriage of the emperor in the *Hierogamia*, and the birth of the king of Rome in the *Api Panaoride*. He also made a translation of the *Iliad*, which is highly esteemed for elegance and fidelity, though he confessed that he knew nothing of Greek, and had studied Homer only through numerous translators and commentators. It was attacked by Ugo Foscolo and other Hellenists, and defended by Monti. After the loss of his honors by the overthrow of Napoleon, he wrote chiefly in prose, though he consented to compose two short poems in praise of the imperial house of Austria. His principal production was a philological work, in which he assailed the principles of the Della Cruscan, and which gave rise to a warm controversy. As a classicist, Monti may be regarded as the last eminent Italian poet of the old school, and he constantly opposed the romanticists who aimed to modernize the national literature. A complete edition of his works was published in 8 vols. (Bologna, 1828), and a select edition in 5 vols. (Milan, 1832).

MONTIGNY, ROSE CIZOS LEMOINE. See *CHERI*.

MONTIJO, the name of a domain in Estremadura, Spain, which in 1697 was raised to the

rank of a county by Charles II. in favor of Count John of Porto Carrero. The ancestry of the latter was traced to Egidio Bocanegra, a Genoese, who in 1840 assisted Alfonso XI. against the Moors, and who became domiciliated in Spain, after having been promoted by Alfonso to the dignity of admiral and count of Palma. The grandson of Bocanegra assumed the title and rank of the house of Porto Carrero on his marriage with the heiress of that family, and one of his successors assumed the title of count of Taba. A descendant of the latter, the count of Montijo, duke of Penaranda, fought in favor of Napoleon I. during his war with Spain, served with distinction in the French army after the expulsion of the French from Spain, and subsequently became a member of the Spanish senate. He died in 1839, and was the father of the present empress of France. (See *EUGÉNIE*.)

MONTMORENCY, an E. co. of Canada East, bordering on the St. Lawrence, and drained by the Montmorency and St. Anne rivers; area, 7,465 sq. m.; pop. in 1852, 9,598. It has an uneven surface and fertile soil. The Isle of Orleans in the St. Lawrence river is included in the county.

MONTMORENCY, a river of Canada, which runs in a very irregular N. and S. course of about 15 m., first through forests and then over a rocky bed through a cultivated country, until, close to the St. Lawrence, about 8 m. below Quebec, it falls over a precipice some 230 feet high, down which it descends nearly perpendicularly. The breadth of the river is about 50 feet, and the stream of water, except during floods, is of no great magnitude. A few years ago a suspension bridge was erected directly over the cataract; but, the fastenings upon the banks of the river being insufficient, it fell shortly after it was opened, while a farmer with his horse and wagon and two foot passengers were crossing.

MONTMORENCY, a village of France, situated near the forest of the same name, 14 m. N. from Paris; pop. about 2,800. It possesses a fine Gothic church of the 14th century, and near the town is the house called *L'Ermitage*, which was the property of Mme. d'Épinay, and in which Jean Jacques Rousseau resided for some time. He is said to have written there his *Nouvelle Héloïse*. It was afterward occupied by Grétry the composer, who died there in 1818.

MONTMORENCY, the name of one of the oldest and most illustrious of the French feudal families, deriving its title from the village of Montmorency. Its origin has been traced as far back as the middle of the 10th century, and its members were styled "the first barons of France," or "the first Christian barons." Many of them held high offices, including 6 grand constables, 12 marshals, and 4 grand admirals of France, beside a number of cardinals, grand masters, and knights of all European orders. They more than once intermarried with royal families. Several branches issued from the main stock, two of which established themselves

in the Netherlands. Among their descendants were the count of Horn (Philip II. de Montmorency-Nivelle), who together with Egmont was executed in Brussels by order of the duke of Alva in 1568, and Floris de Montmorency, baron de Montigny, who, according to the recent investigations in the archives of Simancas by M. Gachard, was privately executed by order of Philip II., Oct. 14, 1570, his death having been differently and variously described by previous historians. Another celebrated member of the Flemish branch of the Montmorencys was Marshal Luxembourg. There are 4 or 5 representatives of the name still extant. The chief historical characters belonging to this family are the following: I. ANNE, 1st duke of Montmorency, grand constable of France, born in Chantilly in March, 1493, died Nov. 11, 1567. He was an early friend of the duke of Angoulême, afterward Francis I., and first distinguished himself as a soldier under the reign of Louis XII., in the battle of Ravenna, which was won in 1512 by Gaston de Foix. He followed Francis I. in his first expedition to Italy (1515), and fought bravely at Marignano. In 1521 he evinced great activity and firmness during the siege of Mézières, which was defended by Bayard against the army of the emperor Charles V. For his gallantry in the disastrous battle of Riccio, near Milan, in 1522, he was rewarded by the rank of marshal. When the constable of Bourbon invaded Provence at the head of an imperial force in 1524, Montmorency forced him to raise the siege of Marseilles. In 1525 he was made prisoner at the battle of Pavia; but being ransomed, he participated in the negotiations which ended in the treaty of Madrid (1526). He now became governor of Languedoc and grand master of France, and was intrusted with the management of the finances. His avarice gave dissatisfaction to the Genoese admiral Doria, who broke off his alliance with the king of France and became one of the staunchest supporters of the emperor Charles V. In 1586, an imperial army having again entered Provence, the marshal laid waste the country, and by skilfully prolonging the campaign nearly destroyed the enemy. On this occasion he received the appellation of the "French Fabius," and two years later he was made constable. In 1541 court intrigues caused his disgrace, and he retired to his castle at Chantilly. After the death of Francis I. he returned to court, where his influence became paramount; offices, pensions, and favors of all kinds were bestowed upon him and his relations, while his baronial estate was erected into a duchy by Henry II. In 1548, the inhabitants of Guienne having revolted on account of the oppressive tax on salt, he went to Bordeaux at the head of 10,000 men, and put down the insurrection with the most cruel severity. On the invasion of Champagne by Duke Philibert Emmanuel of Savoy, the celebrated general of Philip II., he was sent to oppose him, but by his imprudence lost the battle of St. Quentin, Aug. 10, 1557, and was taken prisoner. Anxious for

his own release, he was instrumental in bringing about in 1559 the disadvantageous peace of Oateau-Cambrésis. During the short reign of Francis II. he lived in retirement; but he played a conspicuous part during the reign of Charles IX., and in concert with the duke of Guise and Marshal St. André, with whom he formed a sort of triumvirate, was an uncompromising enemy of the Huguenots. Having on one occasion broken into their church in the rue St. Jacques at Paris, and ordered his followers to destroy every thing therein, he received the sobriquet of *Capitaine Brûle-bancs*. In 1562, at the battle of Dreux, where he shared the command with his two colleagues, he was wounded and taken by the Protestants, but Guise managed to win the day. Released by the peace of Amboise in 1563, he retook Havre de Grâce, which had been seized by the English. He plotted a massacre of the Protestants; but the court would not approve his proposal, and he was consequently sent into retirement at Chantilly. He appeared once more on the stage of public affairs in 1567, when, at the head of the Catholic army, he met the prince de Condé near St. Denis, and fought a drawn battle in which he lost his life. It was ascribed to his faulty plan of operations that his army did not gain a victory. His death was welcome news to Queen Catharine de' Medici and the courtiers, whom he had frequently offended by his overbearing manners. II. HENRI II., 4th duke of Montmorency, grandson of the preceding, born in Chantilly in 1595, executed in Toulouse in 1682. Henry IV. was his godfather, and Louis XIII. appointed him admiral of France before he was 17 years old. He succeeded his father in the governorship of Languedoc, fought against the Protestants, distinguished himself at the sieges of Montauban and Montpellier, and in 1625 conquered the islands of Ré and Oléron. He now sold his office of admiral to Richelieu, who kept it for himself, and was thus enabled to control the operations at the celebrated siege of La Rochelle. Montmorency continued to oppose the duke of Rohan, who remained in arms for 8 months after the taking of his party's stronghold, and thus contributed to bring about the peace of Alais (1629), which terminated the last of the religious civil wars in France. He moreover, in the same year, distinguished himself in Italy, and was at last appointed to a marshalship, which he considered but a meagre reward for his services. After his return to Languedoc he received overtures from Gaston of Orleans, the brother of Louis XIII., and was persuaded to join that prince in armed rebellion. He assembled his troops while Gaston was entering the kingdom from Lorraine at the head of a few thousand adventurers; but in the battle with the royalists at Castelnaudary in Sept. 1632, he was deserted by his ally, and taken prisoner. Arraigned before the parliament of Toulouse, he was sentenced to death, and by order of Richelieu publicly beheaded in the great square of that city, although all the

nobles prayed for his pardon. His life was written by Ducrois, one of his officers (4to., 1633). III. MATHIEU JEAN FÉLIOTTE, vicomte and afterward duke of Montmorency, a French statesman, born in Paris, July 10, 1767, died March 24, 1826. He entered the army, served in the American war, was elected deputy to the constituent assembly in 1789, and was among the foremost, during the famous night of Aug. 4, to move for the spontaneous renunciation of all feudal privileges and titles of nobility. Alarmed, however, by the progress of the revolution, he emigrated in 1792. Returning after the fall of Robespierre, he kept aloof from politics, and lived on terms of intimate friendship with Mme. de Staël, and above all with Mme. Récamier, for the latter of whom his affection amounted almost to adoration. He received no favors from Napoleon, but on the return of the Bourbons he was appointed aide-de-camp to the count of Artois, peer of France, and in 1822 minister of foreign affairs. He was one of the French plenipotentiaries in the congress at Verona, the other being Châteaubriand; and on his return he became governor to the young duke of Bordeaux. Although he had no literary merit, he was elected to the French academy in 1825. He was noted for his piety, and breathed his last while at prayer in church.

MONTMORENOY, FRANÇOIS DE. See BOUTEVILLE.

MONTOUR, a central co. of Penn., intersected by the N. branch of the Susquehanna river, and drained by Chillisquaque, Mahanouring, and Big Roaring creeks; area, 210 sq. m.; pop. in 1850, 13,289. Its surface is hilly, being traversed E. and W. by several barren ridges, including Montour's and Limestone ridges and Muncy hills. There are several iron mines producing large quantities of metal. The valleys are fertile. The productions in 1850 were 126,217 bushels of wheat, 138,279 of Indian corn, 98,156 of oats, 14,899 lbs. of wool, 276,941 of butter, and 10,429 tons of hay. There were 11 grist mills, 4 saw mills, 8 founderies, 3 forges, 8 tanneries, 35 churches, and 3,715 pupils attending public schools. It is traversed by the North Branch canal, and by the Catawissa, Williamsport, and Erie railroad, passing through the capital, Danville.

MONTPELIER, a town in Washington co., Vt., and the capital of the state, situated on the Winooki river, 205 m. N. N. E. from Boston, in lat. 44° 17' N., long. 72° 36' W.; pop. in 1859, estimated at 3,000. The Winooki is here spanned by a substantial bridge, and its numerous tributaries afford water power. The village is built on low ground, and the streets are raised above the natural level. The state house was burned down in 1857, and has been replaced by a new edifice built upon the same plan somewhat enlarged. It is constructed of granite in the form of a cross; the entire length of the front is 176 feet, the depth of the main building 113 feet, and the height to the top of the dome 124 feet. It is surmounted by a

statue. There are 5 churches (Congregational, Episcopal, Free, Methodist, and Roman Catholic), 5 district schools, the Washington county grammar school, the Montpellier union district school, 2 insurance offices, 8 banks with an aggregate capital of \$250,000, 5 newspapers, an iron foundry, flour mills, and manufactories of sashes and blinds, carriages, timber, hats, caps, furniture, and plate, \$500,000 being invested in trade and manufactures of all sorts. Montpellier is a station of the Vermont central railroad. A history of Montpellier by D. P. Thompson was published in 1860 (Montpellier, 8vo.).

MONTPELLIER, a city of southern France, capital of the department of Hérault, situated on an eminence near the Lez, 80 m. S. W. from Nîmes, 17½ m. by railway N. W. from Cette, its port, and 76 m. W. N. W. from Marseilles; pop. in 1856, 40,577. It was once a place of some strength, but, except the citadel, there are now no considerable remains of its fortifications. The town gate on one side of the promenade du Peyrou was erected to commemorate in various bass-reliefs the glories of the reign of Louis XIV. The principal edifices are the modernized cathedral, the new *palais de justice*, the citadel, the anatomical theatre, and the *école de médecine*, an ancient and renowned institution, said to have been founded by Arab physicians, containing valuable anatomical collections, the doctor's robe in which Rabelais was here installed, and a library of 85,000 volumes and 600 MSS. The Musée Fabre, named after a Montpellier artist of that name, contains a portrait of Lorenzo de' Medici, as well as another picture, attributed to Raphael; the "Infant Samuel at Prayer," by Sir Joshua Reynolds; and other interesting works of art. The promenade du Peyrou, one of the finest public walks in Europe, adorned with an equestrian statue of Louis XIV., occupies the summit of a hill at one extremity of the city. Here, in a hexagonal tower, called *château d'eau*, is the great reservoir which supplies all the local fountains with water, itself being fed by an aqueduct 5 miles in length, and resting on 53 large and 183 smaller arches, measuring nearly 8,000 feet. The most important manufactures are woollens, muslins, printed cottons, table linen, hosiery, hats, leather, paper, brandy, earthenware, and oil. Montpellier is particularly renowned for its manufacture of verdigris, its chemical works, and its distilleries of brandy from the wines of the district. The botanical garden of Montpellier is said to have been the first established in France, and contains the *galactodendron*, the South American cow or milk tree, mentioned by Humboldt. Mrs. Temple (Narcissa), the step-daughter of the poet Young, is believed to have been buried in this garden, burial having been denied to her in the cemetery; some, however, contend that she was buried at Lyons. Montpellier is renowned for the mildness and salubrity of its climate, and is much frequented by consumptive invalids; yet it is often visited by the cold blasts of the mistral

winds. Cambacérés the statesman, Daru the historian of Venice, and Chaptal the chemist, were natives of this city.

MONTPENSIER, ANNE MARIE LOUISE D'ORLÉANS, duchess of, better known as Mademoiselle, a French princess, born in Paris in 1627, died in 1698. She was the daughter of Gaston, duke of Orleans, the brother of Louis XIII.; and being moreover one of the richest heiresses in the world, her whole youth was passed in negotiations of marriage, which were defeated, as she declared, by the intrigues of Cardinal Mazarin. It was proposed to unite her to her cousin Louis XIV., who was 11 years her junior, to Philip IV. of Spain, to the prince of Wales, afterward Charles II., to the emperor Ferdinand III., to his brother the archduke Leopold, to the duke of Savoy, and to the king of Portugal. During the wars of the Fronde she sided with the Frondeurs, and compensated by her boldness and capacity for the weakness and indecision of her father. When it was proposed to send an expedition to Orleans she volunteered to command it, forced her way into the city by one gate while the royalists were vainly seeking admission at another, and secured the adhesion of the authorities to the cause which she favored. Returning to Paris in time to assist Condé at the battle of the Porte St. Antoine, she caused the guns of the Bastille to be fired upon the royal troops, though she still did not despair of becoming the wife of the young king. "That gun," said Mazarin, "has killed her husband." Banished with her father after the reestablishment of Louis' authority in Paris, she employed her exile in the composition of her *Mémoires*, which were first printed at Amsterdam in 1746, and have since been edited by Cheruel (4 vols. 12mo., Paris, 1856). After being recalled and again disgraced, she finally returned to Paris in 1660, and lived in comparative retirement until 1689, when at the age of 42 she fell in love with Lauzun, a poor Gascon noble 6 years younger than herself. The king, yielding to her entreaties, gave his consent to the marriage, but was afterward induced to revoke it and to commit Lauzun to the Bastille, where he was confined for 10 years. It is said, however, that a secret marriage had already taken place. Mademoiselle finally obtained his release by giving up two of her largest estates to the duke of Maine, the king's natural son by Mme. de Montespan, but Lauzun proved brutal and ungrateful. She forbade him her presence, and passed the rest of her life in devotional exercises, unnoticed and almost forgotten.

MONTPENSIER, ANTOINE MARIE PHILIPPE LOUIS D'ORLÉANS, duke of, a French prince, born in the chateau of Neuilly, July 31, 1824. He is the 3d son of Louis Philippe, and at an early age served in the French army, distinguishing himself in Algeria in 1844 and 1845, and was promoted to the rank of general in 1846. On Oct. 10, 1846, he married Maria Luisa Ferdinanda de Bourbon, a sister of the present queen of Spain—an alliance which had been greatly opposed by England, on account of Louis Phi-

lippe's supposed ambitious designs. After the revolution of 1848, the duke of Montpensier removed with the rest of his family to England, and has since chiefly resided in that country and in Spain. He has 5 children, the youngest born in 1859. He holds a superior rank in the Spanish army.

MONTREAL, a city of Canada East, and the largest in British North America, situated in lat. 45° 31' N., long. 73° 35' W., at the base of the Royal mountain from which it takes its name, 180 m. S. W. from Quebec, 600 m. from the gulf of St. Lawrence, and 420 m. N. from New York, upon the S. side of a large island at the confluence of the Ottawa and St. Lawrence rivers. This island, also named Montreal, is about 30 m. long, by 10 at its greatest breadth, and is at the head of ship navigation. The population of Montreal in 1851 was 57,715; in 1856, 75,000; in 1860 (estimated), 86,000. The city is divided into an upper and a lower town, the former of which has wide streets and large handsome buildings, whose glittering tin or sheet iron roofs present a pleasing appearance from a distance. The building material most in use is a grayish limestone. The lower town has a cramped and gloomy aspect; the streets are narrow and ill-paved, and the houses are generally in the French style with dark iron shutters. Some of the public edifices are fine specimens of architecture. Christ church (Episcopal) cathedral, recently completed, is cruciform in plan, the nave and aisles being 112 feet long and 70 feet wide, and the transept 100 feet long and 25 feet wide; the tower is 224 feet high; the material is rough Montreal stone with facings of Caen stone. The Roman Catholic parish church on the Place d'Armes, constructed in the Gothic style, is 255 feet long and 184 feet wide; it has 6 towers, of which 3 belonging to the principal front are each 220 feet high; the principal window is 64 feet high and 32 feet broad; and the church is capable of holding from 10,000 to 12,000 people. The whole number of churches in 1858 was 80 (2 Baptist, 4 Church of England, 2 Church of Scotland, 2 Congregational, 1 Free, 1 French Protestant, 1 Huntingdonian, 2 Methodist, 3 Presbyterian, 8 Roman Catholic, 1 Unitarian, and 3 Wesleyan). The principal benevolent institutions are the home and school of industry; the general hospital of the sisters of charity or gray nuns for foundlings, orphans, and infirm persons, with a branch establishment for females; the Hôtel Dieu, under the charge of the hospital sisters of St. Joseph, who also attend St. Patrick's hospital; the house of charity attached to the English cathedral; 2 lying-in asylums; the Montreal general hospital; a dispensary, and an eye and ear institution; Protestant and Catholic Magdalen asylums; a Protestant and 2 Catholic orphan asylums; and the Providence asylum. Among the establishments for education is the university of McGill college, attached to which is the largest school of medicine in British North America, a faculty of law, normal and model schools, and a high

school; a chair of English literature was founded by a donation of \$20,000 from Thomas Molson, and several other gentlemen contributed \$2,000 each. The collège de Ste. Marie is directed by the Jesuits, and Montreal college by the Sulpicians. The collège de Ste. Thérèse and college of the Assumption are also Roman Catholic institutions. The Thomas Molson and Lower Canada colleges are private establishments. The Sulpicians have charge of the ecclesiastical seminary of St. Sulpice, and of the *grand séminaire*, the latter having about 50 students. Among the schools are the national, British, and Canadian, beside many excellent private academies. In 1858 there were 7 daily, 3 tri-weekly, 1 semi-weekly, and 5 weekly newspapers, and 18 monthly and other periodicals.—The principal banks are the Montreal, established in 1818, capital \$6,000,000, with a savings bank attached; the city bank, \$1,200,000; *banque du peuple*, \$1,200,000; bank of British North America, \$5,000,000; Molson's bank, \$1,000,000. These banks have their head offices in Montreal. The commercial bank, Ontario bank, and numerous other banks have branch offices in the city. The city and district savings bank transacts a large business. The Montreal and city banks possess very handsome and costly buildings on Great St. James street. The custom house is an elegant and stately edifice by the river side. The duty collected during the first 8 months of 1860 was \$1,629,780; during the same period in 1859, \$1,611,926. The merchants' exchange on St. Sacrament street is in the modern Italian style of architecture, and contains a well supplied reading room, a meeting room, and offices. The old government house on Jacques Cartier square, where the French governors held their levees, is now used for the Jacques Cartier normal school. The court house, a handsome new building erected at a cost of nearly \$300,000, faces a spacious esplanade called the Champ de Mars. A crystal palace was erected for an exhibition of the products of the province, and was opened by the prince of Wales, Aug. 25, 1860. One of the finest of the public edifices is the Bonsecours market, a Doric edifice crowned by a dome, and containing in the upper stories a concert or ball room capable of seating 4,000 people, and a number of offices. At the head of Place Jacques Cartier there is a column to the memory of Lord Nelson. The Victoria bridge across the St. Lawrence at Montreal was begun July 20, 1854. Its length, including the abutments, from bank to bank, is 10,284 feet, or nearly 2 miles. The tube which forms the girder and roadway is 6,600 feet in length, 16 feet wide, and 22 feet high, except at the extremities, where the height is only 19 feet. There are 24 piers. There were employed in its construction 3,000,000 cubic feet of masonry, 10,000 tons of iron, 2,000,000 rivets, &c. The cost was about \$6,000,000. It was completed in the autumn of 1859, and formally inaugurated on Aug. 25, 1860, on the occasion of the visit

of the prince of Wales.—The city is well lighted with gas. The original Montreal gas works were begun in 1836, but it was not till Nov. 1837, that any gas was used in the city. The new city gas company was incorporated in 1847 with a capital of \$3,000,000. Water is obtained from the St. Lawrence about 1½ m. above the Lachine rapids, and is conducted 5 m. through an open canal to the outskirts of the city, where a reservoir 623 feet long and 178 feet broad, with a capacity of about 15,000,000 gallons, has been erected at an elevation of 200 feet above the harbor. The works were begun in June, 1838, and water was admitted in Sept. 1856. The total expenditure up to Oct. 31, 1856, was \$1,140,000. A by-law authorizing the construction of a horse railway in the public streets was passed Sept. 12, 1860. From Nov. 1, 1855, to Nov. 1, 1856, 543 houses were built; in the year ending Dec. 31, 1857, 876; in 1858, 282; and about 400 in 1859.—The city government is vested in a mayor, 9 aldermen, and 18 councillors. There is an assessment of 7½ cents in the dollar on all real property within the city. The revenue of the city from the assessments imposed on real estate was, for 1850, \$60,880; in 1855, \$106,960; in 1856, \$115,044. The aggregate value of the real estate in 1856 was \$25,565,833. The total revenue from all sources in 1856 was \$285,082. Montreal is the see of an Anglican archbishop, who is the metropolitan of Canada, and of a Roman Catholic bishop. It is the head-quarters of the British army in North America.—Montreal is very favorably situated for manufactures, having unlimited water power within the city or in the immediate vicinity. Materials from foreign countries can be brought here without transshipment, and iron ore exists in the neighborhood within easy distance for water carriage. The Lachine canal affords excellent mill sites, but its waters were suffered to run to waste until 1846, when the commissioners of public works offered to lease a number of lots on the canal and river bank inside the upper basin for manufacturing purposes. There are now on the spot several flour mills, spike and nail factories, foundries, &c., and others have been established in various places. The principal manufactures now are axes, saws, India rubber shoes, cotton bags, woollens, paper, cordage, type, joiners' finishings, chairs, and steam engines. The port of Montreal in 1830 was not very large, but always secure for shipping during the time that the navigation of the river was open. A few years subsequently we find the quays of Montreal described as being unsurpassed by any in America, built of solid limestone, and uniting with the locks and cut stone wharves of the Lachine canal. The harbor commissioners are still making improvements. They are at present constructing a new basin for ocean steamers at the foot of McGill street, which will be 730 feet long, and will accommodate 8 first class steamships; the cost will be about \$76,000. They are also about to commence the rebuilding of the island wharf,

late Market island, at a cost of \$24,000; the wharf is to be continued below the Victoria pier, for a further distance of 2,500 feet, at a cost of \$64,000. In 1820 the average passage of sailing vessels between Quebec and Montreal was 16½ days; in 1821, 14 days; in 1822, 15½ days. In 1824 a tug steamer was put upon the route; and the passage is now made, with the aid of tug steamers, in about 30 hours. The first movement toward the steam navigation of the St. Lawrence was made Oct. 31, 1809, when the Accommodation started on her first trip to Quebec. It was considered dangerous to continue the voyage during the night, and 3 days were consumed in the downward trip and 4 in the upward. A few years later, boats were run during the night with perfect safety, overcoming all the former difficulties of the navigation. Public attention having been drawn to the importance of securing for Canada a line of steamships, in 1858 the government made a contract with Messrs. McLean and co. for the establishment of a regular line of mail steamers. The first vessel which arrived in pursuance of that contract was the Genova, which reached Montreal May 16. In 1854 the vessels of these contractors made 6 trips. In 1856 the vessels of the Montreal ocean steamship company made 14 voyages from Liverpool to Montreal and back, transporting from Liverpool to Canada 2,680 passengers and about 10,500 tons of goods; from Canada to Liverpool 1,724 passengers, 186,900 bushels of wheat, 52,400 barrels of flour, and 5,500 barrels of ashes. The following tables show the commerce of Montreal for a series of years:

| Years. | Entered. | | Cleared. | |
|-----------|--------------|----------|-------------|----------|
| | Vessels. | Tonnage. | Vessels. | Tonnage. |
| 1833..... | 258 | 52,719 | 256 | 50,908 |
| 1854..... | 275 | 72,805 | 251 | 72,917 |
| 1855..... | 188 | 47,894 | 185 | 57,493 |
| <hr/> | | | | |
| | Imports. | | Exports. | |
| 1856..... | \$16,144,696 | | \$2,017,804 | |
| 1857..... | 16,948,582 | | 7,168,744 | |
| 1858..... | 11,584,068 | | 6,200,500 | |
| 1859..... | 15,690,340 | | 6,456,222 | |

Being at the head of marine navigation proper, the city is the port for the great chain of river, lake, and canal navigation which extends westward to Fond du Lac and Chicago, a distance of about 1,400 miles, embracing the largest extent of inland water communication in the world. The Lachine canal, the first in the link, extends from Montreal to Lachine, cuts across the southern point of the island, and avoids the Lachine rapids. The Beauharnois canal extends from the village of Beauharnois to Hungry bay, and passes the rapids of the Cascades, Cedars, and Coateau. The Cornwall canal, commencing at Cornwall and ending at Dickinson's Landing, passes the Long Sault rapid. Farrand's Point, Rapid Plat, Point Iroquois, and Galops Rapid canals are short and detached. The Welland connects Port Dalhousie on Lake Ontario with Port Colborne on Lake Erie. The grand trunk railway connects the city with Portland, Me., and

all the principal places of Canada; and the Montreal and Plattsburg, extending to Lake Champlain, gives it communication with New York.—The settlement of Montreal dates from 1535, when Jacques Cartier established himself at the small Indian village of Hochelaga, which was the germ of the present city. In 1644 the entire island became by royal grant the property of the Sulpicians at Paris, one of whom, the abbé Quelus, shortly after landing, established the seminary of St. Sulpice in Montreal. On Aug. 16, 1642, the spot destined for the city was consecrated, and named *Ville Marie*, a name which it retained for a long period. Passing over an interval of 100 years, we find from a plan bearing the date of 1758 that Montreal was then surrounded by walls, flanked by 11 redoubts which served instead of bastions. The ditch, which was dry, was about 8 feet deep, and of a proportionate breadth. On Sept. 8, 1760, the town was surrendered to the British. In Nov. 1775, it was captured by the Americans under Gen. Montgomery, and held till the following summer. In 1797 the town contained about 1,200 houses, of which 500 only were within the walls; the rest were in suburbs, which commenced from the N., E., and W. gates. The houses in the suburbs were built principally of wood, but those within the walls were all of stone. At different times Montreal has suffered materially by fire. On May 18, 1765, a fire broke out in the city, and in a few hours destroyed 108 houses, and reduced 215 families to the greatest distress. A considerable sum was raised in England and forwarded for their relief. It was computed that one fourth part of the city in size was consumed, and about one third part in value, the loss being estimated at \$484,000. The population of Montreal at this period was about 7,000. On April 11, 1768, another conflagration broke out, and raged with incredible fury till 5 o'clock the next morning, when it partially subsided. Ninety houses, two churches, and a large charity school were consumed. In July, 1852, a fire consumed a large portion of the city; three fourths of the houses in the St. Mary's ward were swept away. The appearance of the city, however, has been greatly improved in consequence of this fire. Before 1852 the whole of the Quebec suburb, with very few exceptions, was an irregular collection of wooden houses, often of only one story, and it is now nearly rebuilt with good brick dwellings, covered with metal or gravel.

MONTREVEL, MARQUIS OF. See BAUME.

MONTROSE, a municipal, parliamentary, and maritime burgh of Forfarshire, Scotland, at the mouth of the South Esk, 70 m. N. E. from Edinburgh; pop. in 1851, 15,288. In that year it contained 5 spinning mills, which consumed annually nearly 6,000 tons of flax, and employed over 2,000 persons. The number of hands engaged in the manufacture of linen averages 1,400. The other leading industrial establishments are starch factories, iron founderies, and ship yards. The harbor is one of the

best on the E. coast of Scotland. Montrose unites with Arbroath, Brechin, Forfar, and Bervie in returning one member to parliament. Joseph Hume, the political reformer, was born in this town, and a statue was erected here to his memory in 1859.

MONTROSE, JAMES GRAHAME, marquis of, a Scotch soldier, born at the family estate of Auld Montrose in the autumn of 1612, hanged at Edinburgh, May 21, 1651. At the age of 14, on the death of his father, he became 5th earl of Montrose. Educated at the university of St. Andrews, he won reputation as a classical scholar and as a poet. On Nov. 10, 1629, he married Magdalene Carnegie, who died in 1638, leaving 8 sons. Montrose then went abroad, and travelled for some years. Being ill received by Charles I. when he visited the court, he joined the Covenanters, who were then opposing that monarch's attempt to fasten episcopacy upon Scotland. He signed the covenant in 1638, and became one of the most influential members of the party. Being sent on a mission to Aberdeen, to induce the citizens to join the national cause, he met with some success; and he did his party good service in the north of Scotland. When the temporary peace of 1639 was made, Charles I. saw much of Montrose, and sought to gain him; but on the renewal of war in 1640, the earl led the vanguard of the Scotch infantry, and was distinguished in the brief hostilities that took place. Soon, however, his opinions underwent a change, and he became a royalist, on the ground that the Covenanters contemplated extreme measures against the government; and he was imprisoned in Edinburgh castle. Charles I. visited Scotland in 1641, and Montrose communicated with him, and was concerned in the plot called "the incident," supposed to have had for its object the murder of Argyle and other nobles. Released in November of that year, Montrose remained for some time on his estates. He went to York to wait on the king, who had written to him, but could not obtain an audience. In 1643 he joined the queen, Henrietta Maria, in England, but could not induce her to authorize him to pursue energetic measures for the royal cause in Scotland, and he returned home. The Covenanters endeavored to win him back to their cause, without success; and in the summer of 1643 he again went to England, and served with the king's army. On Feb. 1, 1644, he was appointed the king's lieutenant-general in Scotland, and proceeded to that country. Reaching the highlands, and working on the hatred which many of the clans felt for the Campbells, he raised a force there, and was joined by some Irish infantry. He then commenced a series of operations, the success of which threw a brilliancy over the royal cause, though circumstances prevented them from becoming useful to the king. On Sept. 1, 1644, he defeated the covenanting army under Lord Elcho at Tippermuir, and took Perth. On the 12th he destroyed another army, headed by Lord Louis Gorgon, in the battle of Aberdeen,

and took that town. After a variety of military operations, he entered Argyle's country, which he ravaged, and defeated the Campbells at Inverloch, Feb. 2, 1645. Receiving large accessions of force, he marched against Dundee, which he stormed, but was compelled to abandon it on the approach of the enemy. On May 8 he encountered Sir John Urrie at Auldearn, and won the most brilliant of his victories. The victory of Alford was won July 2, over Gen. Ballie; whom he again met and conquered at Kilsyth, Aug. 15. Could he have kept his army together he might have possessed himself of all Scotland; but the highlanders formed an unstable force, and Montrose found himself almost without men when he marched to the border. On the morning of Sept. 13 he was surprised at Philiphaugh by David Leslie, and his army routed. In July, 1646, he capitulated to Middleton, and in September he went to the continent. High offers were made to him by the French government, which he would not accept. Visiting Prague and Vienna, he was made an Austrian marshal, and authorized to raise regiments for Charles I. He was greatly affected by the execution of that monarch. Charles II. renewed his commission, and made him a knight of the garter. Having received some arms and subsidies from Denmark, Sweden, Holstein, and Hamburg, he landed in the Orkneys in March, 1650, and proceeded thence to Scotland at the head of an ill-organized force of 1,500, but was speedily defeated and made prisoner. His enemies disgraced their cause by the cruelty of their conduct. He was sent to Edinburgh, where all manner of indignities were heaped upon him, and he was made to die on the gallows; but he baffled the malice of his foes by his determined bearing. His head was placed on the Tolbooth, and his limbs were sent to various parts of Scotland. After the restoration, his remains were collected, and received a public funeral. He had been elevated to a marquessate by Charles I.—See "Montrose and the Covenanters," by Mark Napier (2 vols. 8vo., London, 1838).

MONTSERRAT, or MONSERRAT, one of the smallest of the British West India islands, belonging to the Leeward group, about equidistant, or 80 m., from the islands of Nevis, Antigua, and Guadeloupe; lat. of the N. point, 16° 50' N., long. 62° 12' W.; length 10 or 12 m., breadth 7½ m.; area estimated at 48 sq. m.; pop. in 1851, 7,053, little more than 2 per cent. of whom were white. About ¾ of the island is mountainous and barren, but the remainder, at the base of the mountain slopes, is fruitful and well watered. The soil is of a light volcanic description, well suited for the production of sugar, cotton, coffee, Indian corn, and indigo, beside all the tropical fruits and vegetables. The principal crop is sugar, though at one time indigo was largely grown. The E. side of the island is mostly uncultivated, covered with high mountains producing cedar and other useful and valuable trees; on the W. the land slopes

toward the sea. The climate is healthy. In 1855 the value of the imports was about £8,000, and of the exports nearly £20,000. The trade is mainly with other British West India islands. The chief town is Plymouth, on the S. W. coast; it is small, but neat, and the houses are well built of fine gray stone. In 1854 there were 18 schools attended by 1,623 scholars, more than half of whom were females. The government of Montserrat is administered by a president, under the governor-in-chief of the Leeward group, and an executive council of 8 members appointed by the crown, who also form the legislative council. There is a representative assembly, consisting of 12 members. In 1855 the revenue amounted to £3,500, and the expenditures to £3,264. This island was discovered by Columbus in 1493, and named after the mountain near Barcelona. In 1682 a party of Irish Roman Catholics from a neighboring island settled on it; and after a French invasion in 1712 it was finally made over to Britain by the treaty of Breda in 1746. Representative government was first established on Montserrat in 1689.

MONTSERRAT, or MONSERRAT, a mountain of Spain, on the right bank of the river Llobregat, in the province and 28 m. N. W. from the city of Barcelona. It is about 24 m. in circumference, and is broken into a large number of isolated calcareous peaks, the highest of which is 3,803 feet above the level of the sea. This mountain is remarkable for its hermitages, and formerly had a rich monastery of Benedictines.

MONTUOLA, JEAN ÉTIENNE, a French mathematician, born in Lyons, Sept. 5, 1725, died at Versailles, Dec. 18, 1799. After studying at the Jesuits' college of Lyons and the law school of Toulouse, he established himself in Paris, where he became acquainted with D'Alembert and connected with the *Gazette de France*, a journal then almost exclusively devoted to science and literature. Beside other works, he published anonymously in 1754 *Histoire des recherches sur la quadrature du cercle* (new ed., 1830), and in 1758, *Histoire des mathématiques* (2 vols.). He was appointed intendant-secretary at Grenoble, and in 1764 he accompanied the chevalier Turgot in his colonizing expedition to Cayenne. On returning to France, he became commissioner of the royal buildings, and afterward royal censor of mathematical books. The former of these offices he held for 25 years, till the revolution deprived him of it, and reduced him to poverty. Before his death he was admitted as a member of the institute. In 1798 he published a revised and improved edition of the first part of his "History of Mathematics;" but he did not live to complete the second part, which was finished after his death under the supervision of Lalande (2 vols. 4to., 1802). The continuation by Lalande is considered inferior to the earlier volumes.

MONZA (anc. *Modicia* or *Modetia*), a city of Lombardy, situated on the river Lambro, and forming almost a suburb of Milan, the distance from which city is 9 m. by railway; pop. about

8,000. It was the seat of government during the time of the Lombard kingdom, and many relics of that period are preserved in the cathedral, which was originally a basilica, founded by Theodolinda I. The most celebrated relic there is the iron crown, which Gregory the Great is said to have presented to Theodolinda, and which was used for the coronation of the Lombard kings and of the German emperors as kings of Italy, and more recently for that of Napoleon I. and the emperors of Austria. The sacristy of the cathedral is one of the most remarkable of mediæval museums. Among the public buildings of Monza beside the churches are the *broletto* or town hall, attributed to Frederick Barbarossa, two hospitals, a religious seminary, and various schools, &c. The palace of Monza, which was formerly the country residence of the Austrian viceroys, is surrounded by one of the most celebrated parks of Italy.

MOOLTAN, a city of India, in the Punjab, situated 8 m. from the left bank of the Chenab, in lat. $30^{\circ} 8' N.$, long. $71^{\circ} 28' E.$; pop. about 81,000. It is built over the ruins of several more ancient cities, and formerly had a citadel crowning a high hill. This fortress was swept away by an inundation of the Chenab in 1849. The city is surrounded by a strong wall with 6 gates, outside of which lie extensive suburbs. The bazaars are large and richly stocked; an important banking business is carried on, and there are manufactures of silks, cottons, shawls, brocades, and tissues. Among the remains of ancient edifices scattered over the surrounding country is the magnificent shrine of the martyr Sham Tabresi.—Mooltan has been supposed to be the capital of the Malli which was taken by Alexander. It was captured by Tamerlane in the 14th century, and by Runjeet Sing in 1818, on which latter occasion nearly 3,000 of its defenders were massacred, and booty was carried off to the value of £4,000,000. In 1848 it was the scene of the massacre of two British officers by the Sikhs (see EDWARDS, LIEUT. COL. H. B.); and in Jan. 1849, it was captured by the British under Gen. Whish.

MOON, the satellite of the earth, the nearest of the heavenly bodies to us, is an opaque spheroid 2,160 m. in diameter, shining by reflecting the light of the sun. Situated at an average distance of 238,650 m., she revolves about the earth in 27 days, 7 hours, and 44 minutes. To this motion are due her monthly phases. The course of these, however, is only completed in 29 days, 12 hours, and 14 minutes, owing to the fact that they depend on her position relative to the sun, which is constantly advancing in the direction of her motion; so that, after completing 360° of her orbit, she has the whole amount of the sun's monthly progress, which is an arc of some 30° , to pass over before she can complete her course of phases. The former period is called the sidereal month, the latter the common or synodic month. When not eclipsed, she always presents to the sun an illuminated hemisphere; her phases depend on

how much of that hemisphere we see. If the earth be situated directly between her and the sun, we see all of it; if she is between us and the sun, we see none of it; if she is midway between these positions, we see half of it. In the first position, she is said to be in opposition; in the second, in conjunction; in the third, in quadrature, or quarter; and her phases, in order, are known familiarly as new, crescent, half-moon, gibbous, and full.—From the constancy of the physical features of the moon's disk, it is evident that she always presents to us the same hemisphere. To do this she must turn upon her axis precisely once while making one revolution in her orbit. There are indications that this is the general law of satellites. But it is not quite accurate to say that the moon constantly presents the same hemisphere to every observer upon the earth. Her axis of rotation being inclined one degree and a half to her orbit, and maintaining the same general direction in space as she moves round the earth, she appears to nod backward and forward in an arc of 3° in the course of every revolution, exposing to view the regions just beyond her N. and S. poles alternately. Nor is this all. As the moon's orbit, like that of every other planetary body, is an ellipse, her orbital velocity is not uniform, being most rapid when nearest the earth. Thus she sometimes gets ahead of her mean place, and sometimes lags behind it; and as her axial rotation is absolutely uniform, we are enabled to look over her edge, so to speak, now on the eastern and now on the western side. And again, the constancy of the direction of her hither hemisphere is to be referred to the earth's centre, so that the observer, situated upon the extremity of the earth's radius, views her from an elevation of nearly 4,000 miles; and when she is in the horizon it is plain he can look over her elevated edge, as it were. These several exposures are called the moon's librations: the first her libration in latitude; the second her libration in longitude; the third her diurnal libration.—To the casual observer the places of the moon in different seasons of the year seem exceedingly irregular, being sometimes seen, at the full, coursing along a circle which passes near the zenith in these latitudes, and sometimes, in the same phase, along an arc low down in the southern sky. It is plain that this is mainly owing to the inclination of the earth's equator to the ecliptic; but there is a large residual effect which is due to the inclination of the moon's orbit to the plane of the ecliptic, amounting to $5^{\circ} 8' 48''$, so that during one half of her orbit she is south of the sun's annual path, and during the remaining half north of it. The points where she crosses the ecliptic are known as her nodes; that at which she passes from the southern to the northern side of the line is called her ascending node, the other her descending node. If the ecliptic were a line of light ever conspicuous in the sky, and the moon's path intersecting it also a conspicuous line of light, the place of crossing would be seen to be

different every month, being removed further and further to the westward at intervals of about three diameters of the moon; so that the moon's path, month with month, would be represented by a series of nearly parallel lines about one and a half degrees apart. This movement is known as the retrograde motion of the nodes; the period of completing the whole circuit of the ecliptic is 18 years, 219 days. The orbit of the moon being an ellipse, having the earth at one of its foci, her distance varies in different parts of her monthly course. The nearest point of her orbit is called perigee, the furthest apogee; the two are known as apsides. These points are not fixed in position, but move forward from west to east, occupying successively every position in the circumference of the ellipse in the course of 8.85 years. These two remarkable motions, viz., of the nodes and of the apsides, are due to the disturbing action of the sun.—The question of the moon's habitability is of profoundest interest. We find upon her surface no indications of water, nor of an enveloping atmosphere. The absence of these fluids is explained by well known physical principles. It has been shown that her centre of figure does not coincide with her centre of gravity; that is to say, that one hemisphere is heavier than the other, the lighter half being turned toward the earth. These centres are found to be 83 m. apart. As an effect of this the atmosphere, unless its amount be very great, must collect on the further side, and all waters on the hither side be immediately evaporated and pass over also, on the mechanical principle that ponderable particles, if absolutely free to move, must arrange themselves uniformly around their centre of attraction, which is the centre of gravity of the resulting mass. Notwithstanding these evidences of the absence of two conditions essential for the sustenance of terrestrial life, a recent observer claims to have discovered indications of vegetation on the surface of the moon. These consist of certain traces of a greenish tint which collect and reappear periodically; much as the white spots covering the polar regions of Mars—supposed to be snow and ice—are observed to collect in the winter and waste in the summer of those regions of the planet. As we are able, under the most favorable conditions, to use upon the moon telescopic powers which have the effect to bring the satellite to within 120 to 180 m. of us, we should doubtless notice any such marked changes on her surface as the passage of the seasons produces, for example, on our own globe. In the most powerful instrument yet constructed, Lord Rosse's telescope, the surface of the moon presents a scene of wildest desolation. In every direction are circular caverns or pits, many of enormous size; the floor of one is seen to be strewn with huge blocks. The inner walls are commonly steep, and their depth often frightful, being many thousand feet. They are surrounded by annular ridges, the masses of which would ex-

actly fill the enclosed cavities. In the centre commonly rises a conical mountain. All this plainly points to a volcanic origin. There are large regions perfectly level, which Sir John Herschel thinks are of a decided alluvial character. There are great rings of mountains enclosing areas of 40 to 120 m. in diameter. From these ranges shoot up stupendous peaks, one to the height of 16,000 feet. Isolated peaks here and there rise abruptly from extended plains to the height of 6,000 to 7,000 feet. These elevations are determined by calculations based on the height of the sun above the horizon of the lunar place under inspection, and the length of the shadows cast. The most favorable time for observing these remarkable features is when the moon is crescent. Beyond the illuminated hemisphere mountain peaks, lifting themselves miles above the average level of the surface, will be bathed in sunlight, while the intermediate space is veiled in darkness, and will appear as silver points detached from the bright crescent; or, if a chain stretching toward the rising sun, they may appear as ragged promontories of light jutting far out into the darkness. An admirable chart of the moon has been constructed by the eminent Prussian observers, Beer and Mädler, whose work, *Der Mond*, must be consulted for a full account of the physical condition of our satellite. They place the height of one mountain at 22,823 feet. This, considering the relative magnitudes of the moon and the earth, is far more stupendous than any known elevation of terrestrial surface. More recently M. Secchi, astronomer at Rome, has succeeded in getting a photographic view of the crater called Copernicus, taken from a map executed with great care.—The mass of the moon is not accurately known, though the most trustworthy determinations agree in placing it at about $\frac{1}{80}$ part of the mass of the earth.—The faint apparition of the entire lunar disk at the time of new moon is considered to be due to the reflection of the light received from the earth, whose illuminated hemisphere is then turned toward her. It is disputed that the moon shines by reflected and not native light. Licetna, professor of philosophy at Bologna, suggested the idea that she possesses a phosphorescent quality, by virtue of which her light is simply the result of a propulsion effected by the sun's influence. This idea has been adopted by Professor Leslie; see his "Experimental Inquiry into the Nature and Propulsion of Heat" (London, 1804).

MOONDA, a river of western Africa, rising in the Sierra del Crystal and falling into Corisco bay in the gulf of Guinea, 89 m. S. of the equator, in long. $9^{\circ} 31'$ E., after a W. course of no great length which has been but imperfectly described. Around its mouth there are some high hills, but further inland its banks are long mangrove swamps which exhale a deadly miasma. Bar wood, used as a dye by both the natives and Europeans, grows near it, and caoutchouc may be obtained in its forests. The few

villages bordering upon it are built on the dry ground back of the swamps. Mr. Du Chailu, who ascended the Moonda for 60 m. in 1856 describes it as a very desolate river.

MOOR FOWL. See PTARMIGAN.

MOORCROFT, WILLIAM, an English traveller, born in Lancashire about 1780, died in 1825. He was educated for a surgeon, but devoted himself to veterinary practice in London. In 1808 he went to India as superintendent of the company's stud in Bengal. With the view of introducing stallions from the neighborhood of Balkh and Bokhara, and at the same time of establishing commercial intercourse with the trans-Himalayan districts, he undertook a journey in 1819, setting out from Bareilly in October, accompanied by Mr. George Trebeck, Mr. Guthrie, and two natives, to whom a party of Gorkhas were afterward added. All the expenses of the journey were defrayed from his private purse. After traversing the Himalaya by a route in which no European had preceded him, and determining the sources of the Che-naub and the Hyphasis, he reached Ladakh in Sept. 1820, remained there two years, and then went to Serinagur, the capital of Cashmere, where he spent 10 months. Thence he travelled by way of the Pir Panjal mountains to the Punjab, visited Cabool and Bokhara, and was plundered of much of his property, but effected the purchase of a number of valuable horses, with which he set out on his return in the summer of 1825. At Andkho (lat. 37° 45' N., long. 66° E.) he died of fever, away from his party and under rather suspicious circumstances. His body was carried to Balkh, and there Mr. Guthrie also died. Mr. Trebeck expired shortly afterward at Mazar. Though there seems little room to doubt of the time and place of Moorcroft's death, Father Huc, who visited Lassa in 1846, was told by a servant of the English traveller, and by the regent and Cashmerian governor, that Moorcroft arrived at that city from Ladakh in 1826, lived there 12 years in the disguise of a Cashmerian, and was finally killed by robbers on his way back to Ladakh in 1838. It was only on the examination of his papers, among which were numerous maps, that his real name and character were discovered. An account of his explorations up to his arrival at Bokhara, compiled from the journals and other papers of the travellers, was published by Prof. H. H. Wilson (3 vols. 8vo., London, 1841).

MOORE, a central co. of N. C., drained by Deep, Little, and Lumber rivers; area, about 700 sq. m.; pop. in 1850, 9,432, of whom 1,976 were slaves. It has a diversified surface, and the soil is fertile near the streams. The productions in 1850 were 228,476 bushels of Indian corn, 27,828 of wheat, 555 bales of cotton, and 8,500 lbs. of tobacco. There were 3 grist mills and 2 saw mills, 24 churches, and 1,400 pupils attending public schools. Capital, Carthage.

MOORE, BENJAMIN, D.D., an American clergyman, bishop of the Protestant Episcopal church in the state of New York, born in New-

town, L. I., Oct. 5, 1748, died in New York, Feb. 27, 1816. He was graduated at King's (now Columbia) college in 1768, commenced at once the study of theology, and at the same time gave private instruction in Greek and Latin to a number of pupils. In May, 1774, he went to England to obtain orders, and in June of the same year was ordained deacon and priest by Dr. Terrich, bishop of London. On his return to New York, he became an assistant minister of Trinity church, and succeeded to the rectorship, Dec. 22, 1800. Bishop Provost of New York having resigned his episcopal jurisdiction in Sept. 1801, Dr. Moore was unanimously elected his successor, and was consecrated at Trenton, N. J., Sept. 11, 1801, during the session of the general convention. He was also rector of Trinity church and president of Columbia college. In Feb. 1811, he was attacked by paralysis, which rendered him incapable of further active duty, and Dr. Hobart became assistant bishop in May of the same year. A collection of Bishop Moore's sermons (3 vols. 8vo., New York) was published after his death by his son Clement O. Moore.

—CLEMENT O., LL.D., an American scholar, son of the preceding, born in New York, July 15, 1779. He was graduated at Columbia college in 1798, and, having applied himself to the study of Hebrew, published in 1809 in 2 vols. a Hebrew and English lexicon, with notes, a grammar, and a complete vocabulary of the Psalms. When a diocesan seminary was established in New York, after the removal of the general theological seminary to New Haven, Mr. Moore was appointed professor of "biblical learning, the department of interpretation of Scripture being added;" and on the union of the two institutions in Dec. 1821, under the name of the general Protestant Episcopal seminary, he was reappointed with the title of professor of Hebrew and Greek literature, which was afterward changed to oriental and Greek literature. To this institution he afterward made a gift from his family inheritance of the large plot of ground where it stands in the city of New York. He retired with the title of emeritus professor in June, 1850. Mr. Moore has published a collection of "Poems" (12mo., New York, 1844), and "George Castriot, surnamed Scanderbeg, King of Albania" (12mo., 1850).

MOORE, EDWARD, an English poet and essayist, born in Abingdon, Berkshire, in 1712, died in London in Feb. 1757. For some time he followed the business of a linen draper in London. His first poetical work, entitled "Fables for the Female Sex," appeared in 1744. "The Trial of Selim" was a complimentary offering to one of his patrons, Lord Lyttelton. He next produced two comedies: "The Foundling," first acted in 1748, and "Gil Blas," in 1751, both of which failed. His tragedy of "The Gamester," however (1758), in the composition of which he is said to have received material assistance from Garriok, achieved a popularity and is still performed. His last

literary undertaking was the editorship of "The World," a weekly miscellany.

MOORE, JACOB BAILEY, an American journalist and author, born in Andover, N. H., Oct. 31, 1797, died Sept. 1, 1853. He was at first an apprentice and afterward partner and brother-in-law of Isaac Hill, the printer of the "New Hampshire Patriot," at Concord, and after the dissolution of their partnership in 1823 became a bookseller and publisher. One of his principal publications was a series of "Collections, Topographical, Historical, and Biographical, relating principally to New Hampshire," begun in 1822 and finished in 1824, which he edited with the assistance of Dr. John Farmer. In 1826 he commenced the "New Hampshire Journal," a whig newspaper, which he conducted until 1829; it was subsequently united with the "New Hampshire Statesman." He was a member of the state legislature in 1828, sheriff of Merrimack county from 1829 to 1834, connected for a short time with the "Concord Statesman," and in 1839 editor of the New York "Daily Whig." Under President Harrison he was appointed to a clerkship in the post office department at Washington. Removed by President Polk, he returned to New York, and accepted the post of librarian of the historical society. During the administrations of Taylor and Fillmore he was postmaster at San Francisco. Mr. Moore left several historical and other works, the principal of which are: "A Gazetteer of the State of New Hampshire," compiled with the assistance of Dr. John Farmer; "Annals of the Town of Concord, to which is added a Memoir of the Penacook Indians" (1824); "Laws of Trade in the United States" (1840); and "Memoirs of American Governors" (1846). The last work was the first volume of a series never completed, which was designed to embrace all the colonial and provincial governors to the revolution.—Of his sons, GEORGE H., now librarian of the New York historical society, is the author of a volume on "The Treason of Major-General Charles Lee" (New York, 1860); and FRANK has published "Songs and Ballads of the American Revolution" (12mo., New York), "American Eloquence" (2 vols. 8vo., 1857), and "Diary of the American Revolution" (2 vols. 8vo., 1860).

MOORE, JOHN, a Scottish physician and author, born in Stirling in 1729, died at Richmond, near London, in 1802. He was graduated at the university of Glasgow, and travelled extensively on the continent of Europe, principally as a private tutor, and afterward practised medicine in London. He wrote "A View of Society and Manners in France, Switzerland, and Germany" (1779), and "A View of Society and Manners in Italy" (1781); "Zeluco," the most popular of his novels (London, 1789); and various other works. A uniform edition of his writings, with a memoir of his life, was prepared by Dr. Robert Anderson (7 vols. 8vo., Edinburgh, 1820).

MOORE, SIR JOHN, a British general, eldest son of the preceding, born in Glasgow, Nov. 18,

1761, fell in battle at Corunna, Jan. 16, 1809. He was educated chiefly on the continent while his father was travelling with the duke of Hamilton. The interest of the duke procured him a commission in the army in 1776, and he served in Minorca and afterward in America until 1783, when his regiment was disbanded. Through the influence of his former patron he obtained a seat in parliament, which he held for a short time. In 1787 he was promoted to the rank of major, and in 1790 he became lieutenant-colonel of his regiment, which he accompanied the next year to Gibraltar. The year following he was sent to Corsica, where he particularly distinguished himself under circumstances of great difficulty, and received his first wound while storming the Mozello fort. Upon his return to England in 1795 he was made general of brigade, and attached to a division of foreign troops proceeding to the West Indies. He took part in the capture of St. Lucia, and Sir Ralph Abercromby appointed him governor of the island. In this situation he displayed great sagacity and moderation, and completely subdued the bands of insurgent negroes that infested the island; but the state of his health obliged him to return to his native country in August, 1797. Sir Ralph Abercromby having received command of the forces in Ireland, he requested that Gen. Moore should be placed on his staff, and during the rebellion of 1798 the latter rendered important services, for which he was raised to the rank of major-general. Speaking of this insurrection in his journal, Moore says that "the people would certainly be quiet if the gentlemen and yeomen would only behave with tolerable decency, and not seek to gratify their ill humor and revenge upon the poor." In June, 1799, he accompanied the duke of York on his disastrous expedition to Holland, was severely wounded in 8 places, and returned to England, where he arrived in the latter part of August. In 1800 a force was sent up the Mediterranean, under Sir Ralph Abercromby, who named Moore as one of his major-generals; but it was not until the following year, when the troops proceeded to Egypt, that he had an opportunity of distinguishing himself. In the landing at Aboukir, March 8, 1801, and the engagements with the French troops upon that day, the 18th, and the 21st, Moore was actively employed, and received a sabre wound in the chest and a bullet in the thigh. On the surrender of Alexandria he returned to England, and was made a knight of the bath. He was now engaged for some time in a camp of instruction in Kent, where he displayed as much talent for training men as he had formerly done for leading them. He afterward went to Sicily, and thence, in May, 1808, at the head of 10,000 men, to Sweden to assist in the defence of that country against Napoleon; when, had it not been for the ability and resolution of Moore, all his men must have been sacrificed. He returned with his troops to England, and was immediately sent to Portugal,

where, after the expulsion of the French from that kingdom, and the recall of the British general who had negotiated the convention of Cintra, Sir John was appointed to the command of the army intended to cooperate with the Spanish forces in the Peninsula against the French. He was assured that upon entering Spain he would be joined by 60,000 or 70,000 men, and began his advance from Lisbon in October, 1808, but soon discovered that the patriotic enthusiasm which had been expected did not exist, and that the defeat of the Spanish forces at all points left little hope of a successful campaign. On Nov. 13 Moore found himself at Salamanca with an advance corps, within 3 marches of the French army, and without any Spanish assistance. He had only 8 brigades of infantry and not a single gun in Salamanca; and though the remainder of his forces were on the road to join him, they could not arrive for several days. Notwithstanding his critical position, he determined to risk an advance with a view of drawing the mass of the French force toward the N. of Spain, and thus afford the Spanish armies time to rally. But there was now no army left in the field to oppose the French except his own, and Napoleon at the head of a large force, together with the whole of the French armies in the Peninsula, was advancing to surround him, and it was evident that Moore with 28,000 men could not maintain his position. It was the depth of winter, and his retreat, which began Dec. 11, had to be effected through a mountainous and dreary region in the face of a force vastly superior to his in numbers. The British rear guard quitted Astorga Dec. 31, and having 3 times checked their pursuers, joined the main army at Lugo, where for two successive days battle was offered to Soult by Moore, but not accepted. The retreat commenced afresh, and they reached Corunna Jan. 11, 1809, and 5 days afterward fought and won the battle in which their commander fell by a cannon shot. The troops made good their escape to their ships. Moore was interred in the citadel of Corunna, which surrendered to the French a few days after the departure of the British. Soult caused a monument to be erected to his memory, which is also preserved in the well known lines written upon his burial by Charles Wolfe. Soult, Wellington, and Napoleon have alike borne tribute to the ability of Sir John Moore, whose talents and firmness alone saved the army under his command from destruction. The British parliament had a monument erected to him in St. Paul's cathedral; and his native city raised a bronze statue to his memory at the cost of £3,000.

MOORE, MAURICE, an American patriot and jurist, born in Brunswick co., N. C., died in 1777. He belonged to an Irish family of which the present head is the marquis of Drogheda, and was a grandson of Sir Nathaniel Moore, governor of Carolina in 1705. Having studied for the bar, he acquired a high reputation as a lawyer, was one of the 3 colonial judges of North

Carolina at the time of the revolution, was a member of the provincial congresses which met at Hillsborough in 1775 and at Halifax in 1776, and had a prominent part in framing the constitution of North Carolina. He was one of a committee appointed at the commencement of the revolution to draw up an address to the people of Great Britain on the wrongs of the North American colonies.—ALFRED, son of the preceding, born in Brunswick co., N. C., May 21, 1755, died Oct. 15, 1810. At the age of 20 he became captain in a regiment of North Carolina troops commanded by his uncle Col. James Moore, but was soon afterward obliged to resign in order to provide for his destitute relatives. When the British seized Wilmington, however, he raised a troop of volunteers, with whom he rendered great service to the American cause. In order to alleviate the distress to which his patriotism had reduced him, the general assembly in 1790 made him attorney-general; and though he had not yet mastered the first rudiments of law, he soon attained, by hard study, a foremost rank in his profession, was raised to the bench in 1798, and became associate justice of the supreme court of the United States in 1799. He resigned on account of bad health in 1805.

MOORE, NATHANIEL F., LL.D., an American scholar, born in Newtown, L. I., Dec. 25, 1782. He is a nephew of Bishop Benjamin Moore, was graduated at Columbia college, New York, in 1802, and was admitted to the bar in 1805. He was appointed in 1817 adjunct professor and in 1820 professor of the Greek and Latin languages in Columbia college, retaining this chair until 1835, when he resigned and visited Europe. He had collected a valuable library, which the college purchased in 1837, and at the same time appointed him librarian. In 1839 he made a second voyage to Europe, and extended his travels as far as Egypt and the Holy Land. In 1842 he succeeded Judge Duer in the presidency of Columbia college, from which he retired to private life in 1849. Beside a number of pamphlets and essays, Mr. Moore has published "Ancient Mineralogy" (1 vol. 12mo., New York, 1834; new ed., 1859); "Remarks on the Pronunciation of the Greek Language," in reply to a pamphlet by Mr. Pickering; "Lectures on the Greek Language and Literature;" and a "Historical Sketch of Columbia College."

MOORE, RICHARD CHANNING, D.D., an American clergyman, bishop of the Protestant Episcopal church in Virginia, born in New York, Aug. 21, 1762, died in Lynchburg, Va., Nov. 11, 1841. He was educated in King's (now Columbia) college, New York, and for a brief period followed a seafaring life, after which he studied medicine. Dissatisfied with this calling, he turned his attention to the ministry, and in July, 1787, was ordained a deacon of the Protestant Episcopal church by Bishop Provost of New York, being the first Episcopal minister who received orders in that state.

Soon after he took charge of a small parish in Rye, Westchester co. In the latter part of 1789 he was called to a much larger parish, embracing the whole of Staten island, with which he remained connected 20 years. In 1809 he accepted an invitation to the rectoryship of St. Stephen's church in New York, and in 1814 he was elected to succeed Bishop Madison as bishop of Virginia. Removing thither soon after his consecration, he was appointed rector of the Monumental church in Richmond, a position which he occupied until the close of his life. The efforts of the new bishop were unremittingly exerted to build up the nearly exhausted diocese committed to his care; and so well directed were his labors and so beneficial his example and influence, that at the time of his death the number of Episcopal clergymen in Virginia had increased to upward of 100. During the last 12 years of his life his episcopal duties were shared by Bishop Meade, who had been appointed his assistant, and who succeeded him in office. He was a prominent leader of the evangelical branch of the church.

MOORE, THOMAS, an Irish poet, born in Dublin, May 28, 1779, died at Sloperton cottage, Devizes, Wiltshire, Feb. 26, 1852. By his father, John Moore, a dealer in groceries and spirits, he was brought up in the Roman Catholic faith; and at the school of Mr. Samuel Whyte, a former teacher of Sheridan, he acquired a taste for music, recitation, and dramatic performances, having as early as his 10th year been one of the "show scholars" in the plays gotten up by his fellow pupils. Of his early attempts at verse making he says: "So far back in childhood lies the epoch, that I am really unable to say at what age I first began to act, sing, and rhyme." In 1793 he became a contributor to the "Anthologia Hibernica," a Dublin magazine, subsequently the receptacle of a number of his juvenile poems, which he characterized generally as "mere mock-birds' song;" and in 1794 he was entered a student of Trinity college, Dublin. The period was one of great political excitement in Ireland, but the watchful care of his mother preserved him from any active participation in the plots against the government, in which many of his fellow students were involved. Having taken his degree of B.A., he repaired in 1799 to London to pursue the study of the law in the Middle Temple, carrying with him also a translation of the odes of Anacreon commenced in his school days, and which he proposed to publish by subscription. To the law he gave little attention, but his subscription proved successful; and gaining the acquaintance of the earl of Moira, Lady Donegal, and other influential persons, he was introduced to some of the fashionable circles of the metropolis, where his genial manners and literary and musical accomplishments soon made him a favorite. His "Anacreon," which appeared in 1800, dedicated to the prince of Wales, to whom he had been presented by Lord Moira, was favorably received; and a year

later he produced a volume of original poems under the title of "The Poetical Works of the late Thomas Little, Esq.," a pseudonyme suggested by his diminutive stature. With much that was polished, tender, and natural, the volume contained many pieces of very questionable morality, which were excluded from the collected editions of his poems. In 1803, through the influence of the earl of Moira, he was appointed registrar to the admiralty in Bermuda, where he arrived in Jan. 1804. A few months sufficed to show him that the office was neither lucrative nor adapted to his tastes; and intrusting his business to a deputy, he returned to England, having first made a rapid tour over a portion of the United States and Canada. This part of his life, more than any other, is interwoven with his poetry; and in his "Odes and Epistles," published in 1806 and dedicated to the earl of Moira, he has presented a series of poetical notes of his progress from place to place, which are among the most successful of his minor productions. He commented with severity upon American institutions and the poverty of western literature, but subsequently confessed that his views were mere boyish impressions. In some of these poems the pruriency bordering on libertinism which had characterized "Little's poems" was again discernible, and the volume was severely handled by Jeffrey in an article in the "Edinburgh Review," in which Moore was called "the most licentious of modern versifiers, and the most poetical of the propagators of immorality." The latter immediately sent the reviewer a challenge, and a hostile meeting took place at Chalk Farm, Aug. 12, 1806, which was interrupted by the police before either party had fired a shot. The subsequent discovery that one of the pistols had no bullet gave rise to a story that Moore and Jeffrey had fought with unloaded pistols; and Byron, in his "British Bards and Scotch Reviewers," made a ludicrous allusion to "Little's leadless pistols," for which he was called to account by Moore. A second duel was however avoided, and thenceforth Moore was on terms of warm friendship with both of his antagonists. For several years he led a life of fashionable excitement, a frequent visitor at the seats of his patron, Lord Moira, Lords Lansdowne, Holland, and other whig peers, through whose influence he looked for some preferment (which however never came), but making no serious attempt to support himself by his pen. In 1811, however, upon being married to Miss Bessy Dyke, an estimable young actress, literature became necessary as a profession. Having tried his hand at serious satire in his "Corruption," "Intolerance," and the "Sceptic" (1808-'9), he in a happy hour attempted *jouez d'esprit* and political squibs, conceived in a lighter vein, and from their very lightness more sure to hit the mark. A felicitous example of this species of composition was the "Twopenny Post-Bag" (1818), written like most of his similar pieces in the interest of the whig party, and which, as a

compound of causticity and point with sprightly humor and witty illustration, is in its way unexcelled. These productions continued for many years to be a source of profit to him. For the severity with which he handled the prince regent in some of them Moore has been accused of ingratitude; but, according to his own account, the attentions which he received from the prince were limited to two invitations to dine at Carlton house, and one to attend a grand fête in 1811. In July, 1818, he was established at Mayfield cottage, near Aahbourne in Derbyshire, a place connected with some of his most important literary labors, and which continued for several years his home. Here were written many of the songs adapted to the ancient music of his native country, which, under the name of "Irish Melodies," will ever be identified with his genius and patriotism. They had been commenced as early as 1806, at the suggestion of Mr. Power, a music publisher, and ultimately were extended to 10 series. For the arrangement of the melodies he was indebted to the composer, Sir John Stevenson. On these songs, which have enjoyed a popularity beyond that of any similar poems in the English language, his fame with posterity may be safely permitted to rest; and without adopting the eulogistic language of Byron, that certain of them are "worth all the epics that ever were composed," it is hazarding little to predict that many of them will survive his longer and more ambitious strains. To the lyric department of his poetry were subsequently added 4 series of "National Airs," 2 of "Sacred Melodies," "Legendary Ballads," and many miscellaneous pieces, the airs and arrangements for which were prepared by Sir John Stevenson or himself. In the latter part of 1814 Moore agreed to furnish the Messrs. Longman with a poem of the same length as Scott's "Rokeby," for which he was paid £3,000. The idea of writing an oriental romance had occurred to him several years previous, and at the time of making the contract much of the preliminary reading and a portion of the poem were completed. Two more years of labor produced his "Lalla Rookh," a series of 4 eastern stories, connected by a thread of prose romance. It is the most labored of his works, rich and melodious in the composition, and glowing with a wealth of imagery which wearies by its very excess. So true nevertheless were its pictures of eastern life, that Col. Wilks, the historian of British India, could not believe that Moore had never travelled in the East; and the compliment which Luttrell paid him, when he told him that his

lays are sung

By moonlight in the Persian tongue
Along the streets of Ispahan,

is literally true, the work having been translated into Persian, and read with avidity among many oriental nations. Flushed with the success of "Lalla Rookh," which has since gone through more than 30 editions, the poet accompanied Rogers on a pleasure trip to Paris, where

he obtained the materials for his "Fudge Family in Paris," published in 1818, and succeeded in 1819 by "Tom Orib's Memorial to Congress," both choice specimens of his satiric muse. About this time, at the request of the marquis of Lansdowne, he took up his residence at Sloper-ton cottage, near Bowood, the seat of that nobleman; but had scarcely got settled when intelligence reached him, that in consequence of the faithlessness of his agent in Bermuda, he was involved to the extent of £8,000. Many offers of assistance were made to him, which he steadily declined; and in Sept. 1819, he repaired to Paris to avoid an attachment issued by the court of admiralty for his arrest. Soon after he accompanied Lord John Russell on a journey to Italy, in the course of which he visited Byron at Venice. His impressions of travel were recorded in his "Rhymes on the Road" (1819), a series of poems of unequal merit, which he himself characterized as little better than "prose fringed with rhyme." Establishing himself in Paris in 1820, he sent for his family and resumed his literary pursuits. In Sept. 1822, he received intelligence that, after a tedious negotiation, the claim against him had been reduced to 1,000 guineas, toward the discharge of which the uncle of his agent had contributed £300, while the marquis of Lansdowne deposited a check for the balance; and he at once gladly returned to his Wiltshire cottage. In this year appeared his "Loves of the Angels," a poem founded on oriental legends, but much inferior to "Lalla Rookh." It was followed by "Fables for the Holy Alliance" (1823), one of his series of metrical satires; a witty party pamphlet entitled "Memoirs of Captain Rock" (1824); "Life of Sheridan" (1825), a work containing much information, though rather ornate in style; and the "Epicurean" (1829), an exquisite prose fiction. His most important prose work, however, was his "Notices of the Life of Lord Byron" (2 vols. 4to., 1830), founded on the journals and memorandum books of the poet, and an immense mass of correspondence furnished by Murray the publisher and others. Ten years previous Byron had intrusted to Moore an autobiography, more or less complete, extending to 1820, to be published after his death, and which the latter in 1821 disposed of to Murray for £2,000. The sudden death of Byron in 1824 revealed the existence and projected publication of this manuscript, and Moore was persuaded into an arrangement by which it was repurchased from Murray and burned, on the ground that it contained disclosures affecting the character of many persons, living and dead. Although absolved from any intention to do injustice to the memory of his friend, Moore has not escaped severe censure for destroying a manuscript which Byron had intrusted him with as a vindication of his name and honor, particularly as the objectionable passages, according to Lord John Russell, did not exceed 8 or 4 pages. With such materials as were subsequently procured

he compiled an excellent biography, for which he received from Murray the liberal sum of £4,870. His remaining works comprise "The Summer Fête" (1831), a poem; "Memoirs of Lord Edward Fitzgerald" (1831); "Travels of an Irish Gentleman in Search of a Religion" (1833); and the "History of Ireland" (4 vols. 12mo., 1835), written for Lardner's "Cabinet Cyclopædia." He wrote little else beyond an occasional trifle in verse for the periodicals, and the prefaces and a few additions to a collected edition of his poetical works, published by the Longmans in 1841-'2 in 10 vols. During his long residence at Sloperston cottage he was often absent in the gay circles of the metropolis, where his wit and genial humor ever made him a welcome guest; but his latter years were clouded by domestic grief, his children having all died before him, and by mental imbecility caused by a softening of the brain. "To the last day of his life," says Lord John Russell, "he would inquire with anxiety about the health of his friends, and would sing, or ask his wife to sing to him, the favorite airs of his past days. Even the day before his death he 'warbled,' as Mrs. Moore expressed it; and a fond love of music never left him but with life." In 1835 a literary pension of £300 was conferred on Moore, and in 1850 a pension of £100 was settled on his wife, "in consideration of the literary merits of her husband and the infirm state of his health." He had also by his own computation received for copyright not less, in the whole, than £20,000, and had at different periods of his life been in the receipt of £500 per annum from Power, the publisher of his "Melodies," and of a salary of £400 or £500 for political squibs contributed to the "Times." His yearly outgoings had exhausted these sums, and to provide for the necessities of his wife, his "Memoirs, Journal, and Correspondence" were sold for £3,000 to the Longmans, who published them in 8 vols. (1853-'6), under the editorial supervision of Lord John Russell, in accordance with the testamentary desire of the poet. The journal, embracing the period between 1818 and 1847, gives a tolerably good idea of his daily life; and in his letters the engaging traits of his character are abundantly displayed. Those addressed to his mother, to whom during the greater part of his life he wrote twice a week, are replete with expressions of tenderness, "flowing from a heart uncorrupted by fame, unspoilt by the world." Amid all the demands of the society which courted and flattered him, and in which he perhaps passed too much of his time, he preserved his domestic affections unchanged, and was a devoted son, husband, and parent. To his wife he paid "the homage of a lover," and was rewarded by an affectionate devotion which ended only with his life. Moore has sometimes been censured for his presumed partiality for fashionable life and the acquaintance of titled personages; but his vanity could as little resist the fascinations of public applause, as his buoyant spirits could endure total

seclusion from the world in his rural home, to which, however, he never returned without genuine emotions of delight. It must be added that throughout life he preserved his independence of character, and that with abundant self-esteem he was uniformly just and considerate to his literary contemporaries.

MOORE, ZEPHANIAH SWIFT, D.D., the first president of Amherst college, born in Palmer, Mass., Nov. 20, 1770, died June 30, 1823. He was graduated at Dartmouth college in 1793, entered the ministry, and preached at Leicester from 1798 until 1811, when he was appointed professor of languages in Dartmouth college. He was chosen president of Williams college in 1815, on the retirement of Dr. Fitch; but failing to procure the removal of the institution to the banks of the Connecticut, he resigned in 1821, and was chosen president of Amherst college.

MOORS (Lat. *Mauri*; Sp. *Moros*; Dutch, *Moore*), the people of Mauritania or Morocco. The Arabs who conquered Mauritania in the 7th century converted to Mohammedanism the native population, who in Europe were still called Moors, though in their own language they called themselves Berbers, while by the Arabs they were termed Moghribes, "westerners" or "men of the west." Arabic manners and customs, and in a corrupt form the Arabic language, soon prevailed in the country, the Arab conquerors freely amalgamating with their converts, who far exceeded them in numbers. In 711 an army drawn from this mixed population, under Arab leaders, crossed the straits at Gibraltar, so named from their leader, and began the conquest of the Spanish peninsula. The Spaniards and Portuguese called these invaders Moors because they came from Mauritania, and the term Moors with them soon became synonymous with Mohammedans or Moslems, as the invaders designated themselves. The Spanish writers subsequently applied the term to all the Mohammedans of northern Africa; and when, at the close of the 15th century, the Portuguese made their way around the cape of Good Hope and encountered the Arabs on the coasts of E. Africa and of S. Asia, they still called them Moors. Even the Turks, who in race, in language, and in every thing but religion, were foreign and alien to both Moors and Arabs, were sometimes loosely spoken of as Moors by the Spanish historians.

MOORUK, the native name of a species of cassowary, discovered in 1857 in the island of New Britain, and named by Mr. John Gould *casuaris Bennettii*, in honor of Dr. George Bennett of Sydney, N. S. W., who first brought it to the notice of the scientific world. The height of the bird when standing erect is 5 feet, of which the neck is 2; the color rufous mixed with black on the back, and raven black about the neck and breast; the loose wavy skin of the neck is iridescent with tints of bluish purple, pink, and green; the feet and legs are large and strong, pale ash-colored, the claw of the inner toe being nearly 8 times as long as the others;

there is a horny plate on the top of the head, resembling pearl colored with black lead; the bill is narrower, longer, and more curved than in the emu, somewhat like that of a rail, with a black leathery cere at the base, and a small tuft of black hair-like feathers behind the plate, continued here and there over the neck; the wings are rudimentary; for the generic characters, see CASSOWARY. Living specimens have been exhibited at the London zoological gardens. It seems to form the link between the emu and the cassowary, resembling the former in its bearing and gait; it also resembles the kiwi-kiwi (*aptoryx*) in the style of its motions and attitudes; it is tame and familiar in captivity, and when pleased dances about its place of confinement; it will thrive on boiled potatoes, with occasionally a little meat; it emits a peculiar whistling chirping sound, and some louder notes resembling the name given it by the natives; it is shy, difficult to approach, and still more difficult to pursue on account of its speed in running through the thick brush and its extraordinary power of leaping; it has all the inquisitiveness of the domesticated fowls. The eggs are of about the same size and form as those of the common cassowary, having in most cases thick tuberculated shells; they vary from 13 to 14 inches in circumference in the longest diameter, and from 11 to 11½ in the widest; the color is pale olive green, with darker olive tubercles; sometimes they are smooth and without spots.—Another cassowary, not mentioned in its proper place, is the Australian species, *O. australis* (Wall), discovered in the Cape York district in 1854. It is about the same size as the mooruk; the head is without feathers, covered with a bluish skin, and has a protuberance or helmet of a bright red color; the skin of the neck has 6 or 8 round fleshy balls of blue and scarlet; the body is thickly covered with dark brown wiry feathers; the wings are mere rudiments. The flesh was eaten by its captors, and was said to be delicious. It is stronger and heavier than the emu, very wary, and not easily killed except by the rifle.

MOOSE. See ELK.

MOOSE WOOD. See MAPLE.

MOQUIS, or MOQUINAS, a tribe of semi-civilized or Pueblo Indians of New Mexico, who occupy 7 towns lying between the Little Colorado and San Juan rivers, and between lat. 35° and 36° N. According to Gov. Bent's report in 1846, the tribe included 350 families and 2,450 souls. In the tables of the Indian population of the United States, Mr. Schoolcraft, in his "History and Condition of the Indians," places the number much higher. The following are the names of the towns with their population as stated by him: Oriva, 5,000; Sumonpavi, 1,500; Jupavivi, 1,250; Manzana, 500; Opquive, 650; Chemovi, 750; Tanoquevi, 900; total 10,550. With one exception these people speak the same language, "but are reputed," says Mr. Schoolcraft, "to be separate, distinct, and independent republics; though for mutual

protection they join with each other." Dr. Ten Broeck, of the U. S. army, who was among this people in 1852, and who has given an account of them in Schoolcraft's work, vol. iv., states their number as 8,000. Like the other Pueblo tribes, they cultivate various kinds of grain, fruits, vegetables, and cotton, and raise horses, mules, asses, sheep, and goats. Capt. Sitgraves, in his report published in 1854, states that the Moquis had more than 10,000 acres of Indian corn planted. In former times they were much more numerous than at present, according to their own statement, as well as to the early Spanish writers. Disease and their wars with the Navajoes, a large and powerful tribe, hostile alike to all the Pueblo Indians, have greatly decreased their numbers. Their villages are all upon bluffs in the same valley. "Three of them stand," says Dr. Ten Broeck, "upon a bluff about 300 feet high, and from 30 to 150 feet wide, which is approached by a trail passable for horses only at one point. This is very steep, and an hour's work in throwing down the stones with which it is in many places built up, could render it inaccessible to horsemen. At all other points they have constructed foot paths, steps, &c., by which they pass up and down." "There is a 4th town at 20 m. distant W. by S., and 2 more about S. S. W., and some 8 or 10 m. distance from the first 3. Of these, the two at the southern extremity of the bluff are the largest, containing probably 2,000 inhabitants. They all speak the same language except Harno, the most northern town of the 8, which has a different language and some customs peculiar to itself. It is, however, considered one of the towns of the confederation, and joins in all their feasts." Dr. Ten Broeck thinks it "a singular fact that this town, only 150 yards distant from the middle town, should have preserved for so long a period its own language and customs." The probability is that, like the Coco-maricopa tribe of the Gila, which removed to the vicinity of the Pimo tribe, where their villages adjoin, and who speak languages totally different, the inhabitants of the Moqui village of Harno took up their abode where they are now established for protection. Lieut. Col. Eaton, in his account of the New Mexican Indians (Schoolcraft, vol. iv.), says he was told at Zuni, that the 7th Moqui village was from the pueblo of Taos Indians on the Rio Grande.—The houses of the Moquis are built of stone, laid in mud, probably brought from the plain below, and in the same form as those of the other Pueblo Indians. These consist of several stories built up in the form of terraces; i. e., with one story receding from the other so as to leave a walk or terrace in front. On the lower or ground floor there are no doors or windows, access being had by ladders to the first terrace or roof, and then down through trap doors to the first tier of apartments. The ladders are drawn up at night or when they apprehend danger. The second and upper stories are also reached by ladders from the terrace,

there being no stairways or openings from one story to the other. The dress of the Moquis consists of leggings of dressed skins, sometimes made into boots. Sandals are also worn. Blankets of their own manufacture, some of wool and others of cotton, are worn by both sexes; but during the summer, like all other Indians, the men prefer to go naked, wearing merely a breech cloth round their loins, with moccasins or sandals to protect their feet. In their head dress they are fond of displaying their ornaments, and show much taste in their arrangement. The unmarried women turn their hair up on each side of the head in two inverse rolls, which bear some resemblance to the horns of the mountain sheep. After marriage they wear it in two large knots or braids on each side of the face. The women in the northern town vary their dress and mode of arranging their hair, which is another evidence that they belong to a different tribe. Their pottery resembles that of other Pueblo Indians, in its manufacture and ornaments. Dr. Ten Broeck gives the following account of their mode of marriage: "Instead of the swain asking the hand of the fair one, she selects the young man who is to her fancy, and then her father proposes the match to the sire of the lucky youth. This proposition is never refused. The preliminaries being arranged, the young man on his part furnishes two pair of moccasins, two fine blankets, two mattresses, and two sashes used at the feast; while the maiden, for her share, provides an abundance of eatables, when the marriage is celebrated by feasting and dancing. Polygamy is unknown to them; but at any time, if either of the parties become dissatisfied, they can divorce themselves and marry others. In case there are children, they are taken care of by their respective grandparents." They are a simple, happy, and hospitable people. They have no fermented liquors. They knit, weave, and spin, and make fabrics of cotton. Their pipes are made of a smooth polished stone and of a peculiar shape, which has long been in use among their ancestors. They wear necklaces of a very small sea shell, ground flat, probably procured from California, as they say they were brought them by Indians who lived over the mountains to the west.—Coronado with his companions visited these people in 1540, and describes their manners and customs, houses, agriculture, &c., precisely as we now find them, whence it is evident that they did not derive their civilization from the Spaniards. Venegas, in his "History of California" (1755), says that efforts were made by order of the viceroy of Mexico in 1723 to reduce the province of Moqui to subjection, its inhabitants having previously been converted by the zeal of the Franciscans; but in 1680 they apostatized, and, after killing the persons who instructed them, revolted, together with the other Indians of New Mexico. The fathers succeeded in restoring tranquillity among the various tribes, the Moquis alone excepted; "but all their diligence," says Venegas, "could

not overcome the obduracy of the Moquis, who for many years opposed all offers of their coming among them."

MOQUIN-TANDON, HORACE BÉNÉDICT ALFRED, a French physician, born in Montpellier, May 7, 1804. He studied the natural sciences under Duval, De Candolle, and Auguste St. Hilaire, was graduated as physician in 1822, appointed professor of comparative physiology at Marseilles in 1829, and officiated as professor of botany and director of the botanical garden at Toulouse from 1833 to 1853, when he succeeded M. Richard in the chair of natural history at the faculty of Paris and in the superintendence of the garden belonging to that institution. In 1854 he was admitted as a member of the botanical section of the institute, as successor of Auguste de Jussieu. At Toulouse he was one of the 40 members of the academy of floral games, which are still annually celebrated in that city, and familiarized himself with the Provençal dialect to such an extent, that his *Carya Magalonensis* ("The Nut Tree of Maguelonne," Toulouse, 1836; 2d ed. with French translation, 1844), which he published as a Provençal legend, was accepted by M. Raynouard and other eminent Provençal scholars as a genuine production of the ancient troubadours, until M. H. Fortoul revealed the truth concerning it. His principal work is *Éléments de tératologie végétale, ou histoire abrégée des anomalies de l'organisation dans les végétaux* (Paris, 1841).

MORA, JOSÉ JOAQUIN DE, a Spanish author, born in Cadiz about 1784. He is the son of a magistrate of that city, and was educated at the university of Granada. He joined the army after the French invasion, and fell into the hands of the enemy, who detained him at Autun, where he married a French lady. On his return to Madrid in 1814 he established himself as a lawyer, and became the editor of various literary reviews. In 1820 he translated Jeremy Bentham's address to the cortes into Spanish. In 1828, on the restoration of the absolutist government, he repaired to England, where he supported himself as a book agent for various South American states, and by contributions to several illustrated publications. His efforts in supplying the South Americans with Spanish works procured for him in 1827 the editorship of the official journal of Buenos Ayres. Afterward he exerted considerable influence in Chili as director of the Chilean lyceum, as a journalist, and as under-secretary of state, in which capacity he drew up the present constitution of Chili. He was also instrumental in the promulgation of the Chilean free trade tariff of 1830. He spent some time in lecturing on Scotch philosophy and on other subjects in Peru, and officiated as private secretary to Gen. Santa Cruz in Bolivia from 1834 to 1838, when he returned to London as consul-general of the Peru-Bolivian confederation. In 1843 he returned to Spain, directing for some time the college of San Felipe at Cadiz. Having previously been Spanish consul-general in London, he was reappointed

to this office in 1856, and held it several years. He is a member of the Spanish academy, and by his translation of "Ivanhoe" and the "Talisman" he was the first to familiarize the Spaniards with the writings of Walter Scott. He is the author of a "History of the Arabs" (*Quadre de la historia de los Arabes*, London, 1826) and of other prose works; but his literary fame rests chiefly on his *Leyendas Españolas*, or Spanish legends (London, 1840), and on his lyrical poems in Wolf's *Florista de rimas modernas Castellanas*. According to Wolf he excels most as a satirical poet. He also edited in 1848 the works of Luis de Granada in a collection of the Spanish classics.

MORAL PHILOSOPHY, or **ETHICS** (Lat. *mos*, Gr. *ἦθος*, manner, practice), the science of duty; the principles which prescribe what ought to take place in human conduct and actions. The ancient Greeks divided philosophy into logic, physics, and ethics; the first treated the universal and necessary forms of thought; the second, so much of the subject matter of thought as pertains to material nature; and the third, the whole nature and activity of free and intelligent beings. More precisely defined, ethics is that division of practical philosophy comprehending the doctrines of the right in human life, and is distinguished from policy and æsthetics, which embrace respectively the doctrines of the expedient and the beautiful or noble. Or it may be defined as natural in distinction from civil jurisprudence, treating of the relations, rights, and duties by which the members of universal society are by the law of nature under obligation toward God, themselves, and each other. Ethics regards mental dispositions; jurisprudence outward acts. The former extends to all moral qualities; the latter is limited to the virtue of justice, since no written law can enjoin gratitude or generosity. Moral law is imposed by the conscience; civil law by the decree of the legislator. Right is what a man may lawfully or morally do. Duty is what he must morally do. Crime is what he lawfully must not do. Vice is what he morally must not do. The law of nature, or the law of God, embracing the law of nations, is sometimes used as comprehending the whole of morality, the whole theory of conduct, and sometimes as containing only those unwritten rules of justice which are enforced by punishment in civilized countries, and at the breach of which it would be generally thought, if there were no government, that men might defend themselves by violence. Positive law, natural law, and moral law have been termed the three ascending degrees in the whole science of duty. The first inquiry in moral science is after an ultimate rule, a supreme principle of life, which shall be of imperative and universal authority, and around which shall be grouped all the motives and maxims of action. From this central principle every ethical system receives its character. These systems may be ranged in two classes, according as the ultimate moral rule is

objective or subjective, dependent on something without or within the mind. The most prominent objective theories are those which adopt as the ultimate principle and basis of morality: 1, the authority of the state; 2, the revealed will of God; 3, something inherent in the nature of things; 4, the greatest happiness. Hobbes maintained the first, and Descartes the second. To the third division belong Dr. Samuel Clarke's theory of the fitness of things, Wollaston's of the truth of things, Wayland's of the relations of things, and President Edwards's of the beauty in the union or consent of one mind with the great whole of being, in the love of being in general. To the fourth division belongs the Epicurean theory of personal pleasure, which was made to coexist with virtue by Aristotle, to which Paley gave a more religious aspect by weighing future eternal happiness against present self-renunciation, and which Bentham advanced with reference to public utility and the greatest good of the greatest number. The principal subjective theories find the essence and test of morality in: 1, natural susceptibility to pride, gratified by flattery; 2, an inner reciprocal sympathy; 3, an inner sense, which gives moral distinctions; 4, an immediate intuition. Mandeville defined virtue as the offspring of flattery begotten upon pride, its motives being vanity, and its object praise. Adam Smith urged that the ground of morality was a reflex sympathy, by which the observer changes place in thought with the actor, and affirms the action to be right or wrong according as it receives or repels his sympathy. Shaftesbury and Hutcheson maintained a distinct and specific moral sense, which immediately apprehends moral distinctions, and is to each man the source of obligation and the measure of virtue. Dr. Brown modified this theory by denying the existence of virtue and vice in the abstract, and claiming that a universal sentiment, by reason of the original conformation of the human mind, approves certain intentions and affections as right, disapproves others as wrong, and is the ultimate source of all moral truth. Fr. von Schlegel regarded this moral sense or universal sentiment as an inward revelation, which is in us but not of us, which is a divinely awakened awe of the Supreme Being, and which enjoins obedience to every form of God's commandments. Those who claim an immediate intuition of moral truth suppose in the human mind a higher reason for the apprehension of universal and necessary principles. The reason immediately beholds the right, and is of ultimate and conclusive authority. Its affirmation, founded on intellectual intuition, is the sufficient sanction of duty. Such, with various modifications, is the theory of Oudworth, Kant, and Coleridge.—Ethics is not, like mathematics or metaphysics, an independent science. It rests upon philosophical or theological principles, only the application or operations of which it deals with. It takes a dynamical and not a statical view of the elements of life. It pre-

supposes human liberty, the power to employ our mental and physical capacities as we will, and to determine the end toward which they shall be directed; for otherwise the sentiments of duty and of responsibility would be without foundation, would at most be mere phenomena of the consciousness, and moral philosophy could be only the natural history of human actions. Its distinctive quality would be lost, destiny taking in its place of duty. The supremacy of the conscience, however it be defined, whose mandate is duty, is also presupposed, since a moral nature is prerequisite to the science of moral action. Conscience implies a supreme law, having reference to a general end, and constituting an ultimate rule of right, the determination of which, and its application to all departments of conduct, are the tasks of moral philosophy. A complete moral system states the supreme good of man, the supreme moral principle which should guide his action, and his particular duties to himself, to mankind, and to God.—Christian ethics is the doctrine of Christian life, embracing so much of dogmatics as pertains not to knowledge but action. Schleiermacher, Rothe, and others have regarded it as identical with dogmatics, on the ground that Christian faith and morals, thought and purpose, knowledge and action, are not separable. It differs from philosophical ethics in its subject, which is not man, but Christians; in its principle, founded on the recognized relation between man and God; in its source, being derived not from the reason, but from the teaching of Christ and the apostles; and in our perception of it, which is not by any analytical process, but by the Christian consciousness.—The earliest ethical speculations in Greece appear in the maxims of the gnomic poets. The first attempt to introduce a scientific analysis into the details of practical wisdom was that of Pythagoras, whose moral system was linked with a mysterious symbolism of numbers. Of oriental origin, the Pythagorean discipline has been likened to philosophy on a tripod; it taught by symbols, spoke in tropes, wrote in verses, and, instead of reasoning, uttered oracles. Its elementary ideas are those of unity and duality, the finite and the infinite, the right and the oblique, to the former of which corresponds good, and to the latter evil. From unity the harmony of numbers is derived, and the sovereign good is the rhythmical order of nature. When the principle of unity predominates in intelligent beings, there is spiritual harmony; and as harmony is not unity, but only an imitation of it, so virtue is not absolute goodness, but only an imperfect representation of it. God is the absolute unity, and is alone wise, and to imitate him as far as possible is the duty of all imperfect beings, who cannot be wise, but only philosophers or friends of wisdom. The Pythagoreans distinguished the animal soul, whose seat is the heart, and the rational soul, which abides in the brain, and gave to the latter the supremacy. They, therefore, laid stress on

self-command and temperance as essential to the vision of truth, and tended to ascetic practices, yet maintained that justice and love were inseparable, and were unsurpassed by any school of antiquity in urging the duties of friendship. The Pythagorean aristocracy resembled an oriental sacerdotal caste, and the Pythagorean political institutions in southern Italy mark the conflict between the genius of the Orient and that of Greece, between theocracy and humanity, the nobility and the people, the servitude of tradition and liberty of thought. Heraclitus repeated Pythagoras, and Democritus opposed him, founding the sensualist ethical school, and developing the most complete and scientific moral system prior to Socrates, which was, however, only a corollary and result of his atomic physical doctrines. The sovereign good of man, according to him, is not pleasure but happiness, which consists in constant and tranquil content. To be at once temperate, daring, and confident, and, having never done nor wished any thing absurd, to trust in fortune, was the whole purport of his ethical maxims. The age of the sophists succeeded. They, however, neither formed a school, nor their doctrines a system. Grammarians, rhetoricians, statesmen, metaphysicians, and moralists, from all the schools of Greek philosophy, their special influence was in inspiring respect for intellectual attainments and performances, and their best service was in habituating the Greek mind to a free examination of all human knowledge. The weapon which they wielded was a rhetorical eloquence, under the sway of which the mythological divinities began to lose their majesty, the ancient traditions which had charmed successive generations ceased to have authority, the institutions of state tended toward equality and toward a foundation of reason instead of experience, and the enthusiasm of Greek culture was transferred from martial and political accomplishments to the arts, letters, and oratory. Their method was powerful to destroy rather than build up, yet the common statement that they were intellectual and moral corrupters is elaborately disputed by Mr. Grote. He regards them as the regular exponents of Greek morality, neither above nor below the standard of the age, maintains that Socrates was not their great opponent but their eminent representative, that they were the authorized teachers, the established clergy of the Greek nation, and that Plato was the dissenter, who attacked them not as a sect but as an order of society. Socrates is usually styled the father of moral philosophy; yet he was rather a sage than a philosopher, and is renowned rather for his wonderful moral consciousness and for his power of exciting the analytical faculties of others than for his positive speculative thought. He affirmed the reality of the distinction between good and evil, that it was founded in nature and not in convention, yet he did not precisely determine wherein it consists. He enjoined the supremacy of duty, yet he gave no objective or subjective definition of virtue. His highest

motive was to make reason prevail in human life, public and private, as it prevails in the universe. The elements of his instruction were: a supreme Deity, the principle of order and beauty in nature, and of justice and truth in man; and a series of human virtues, the principal of which were wisdom or a participation in the divine intelligence, justice, which is conformity to universal reason, fortitude, which gives courage and strength to endure trouble and resist difficulties, and temperance, which subdues the passions and makes us capable of intellectual delights. He was the first to treat distinctly of ethical science, apart from cosmological and metaphysical speculations, and laid down the principle of individual and social security and happiness as the end to which all moral precepts have reference. Like the other moral philosophers of antiquity, he confounded ethics and politics, and was a preacher of virtue in the interest of the state.—The aim of Socrates was to reform morals, that of his disciple Plato was to generalize thought. The latter did not frequent public places to teach the excellence of virtue, but, with a mind whose natural function seemed to be the contemplation of the essence of things, he disdained the shadows of earth for the eternal and divine realities of an ideal world, and developed schemes of thought which caused the fathers of the church to recognize him as one of their precursors. His fundamental ethical principle rests upon the antagonism of the visible and the invisible, the divine and the earthly. Man is in exile upon the earth, to which he is united by his senses and passions; but by his pure intelligence, his love, by dim reminiscences and regrets, he communes with heaven, which is his true home. He thus by opposite faculties and impulses tends to opposite goals. By yielding to the one he degrades himself, and to some extent perishes. By cherishing the other he resumes and retains his divine excellences. The four cardinal virtues are temperance, courage (*δύναμις*), wisdom, and love. The first two are relative, the product of earthly imperfection; the second two are real, the remnants of our original perfection. They all have their foundation in wisdom, the fruit of reason, which sees through the material world the world of ideas of which it is a dim copy, and contemplates the supreme beauty of the essential universe. The Platonic morality is therefore speculative; virtue is referred finally to the intellect. A magnificent ideal is presented, the sentiment of love is commanded, and it is assumed that to know the right will be sufficient to practise it. There is no place in his philosophy for that perversity by which the soul sees the better and follows the worse, avoids what it loves and embraces what it hates—a phenomenon, however, which Plato himself has described. The virtue which won his admiration implies a pure intelligence, the obedience to which of the heart and will is presupposed. Nor did he precisely define the nature of moral good and evil; his analysis did not reach to the abso-

lute; and he left truth, beauty, and goodness to blend together and lose themselves in their supreme source. God is the principle of moral order, and virtue consists in the knowing and imitating him. "Alone among the ancient philosophers," says St. Augustine, "Plato made happiness consist not in the enjoyment of the body or the mind, but in the enjoyment of God, as the eye enjoys the light." The principle of the ideal contained in his philosophy has proved itself imperishable, and has more than once in modern times prompted both ethical and metaphysical speculations to higher standpoints.—The ethics of Aristotle place the sovereign good in happiness, which is inseparable from virtue, and consists in life and action. The gods themselves are happy only because they act. This theory of activity, which makes virtue to be the best possible disposition of all human functions, was one of the remarkable amendments made by him in the system of his master. An action is right or wrong only when it proceeds from free will and personal responsibility, and its moral desert must be judged by the end which it proposes, that is, by the intention. The Socratic and Platonic mistake of regarding vice as the involuntary product of ignorance is thus corrected. Virtue is a habit, a sort of moral dexterity; single acts cannot constitute it; but the virtuous disposition must be constant, acquired by oft repeated acts, and underlying the whole art of life. But his characteristic ethical statement is that virtue is a mean between two extremes. At one point all the passions are good; below or above that, they violate the order of nature, and are bad. Equally removed from extreme excess and extreme deficiency there lies in all spiritual and physical conditions an intervening state, which is that of virtue. To act when we ought, in the right circumstances, in the proper manner, and for legitimate persons and purposes—that is the *juste milieu* which characterizes morality. Hence there is always only one way of acting well, but thousands of making a mistake. He however gives no absolute definition of virtue, as an abstract mean between two abstract extremes, does not determine it as a fixed mathematical point, but makes it relative to the circumstances and disposition of the individual, a centre varying according to the pains and pleasures, desires and hatreds which encircle it. This ingenious theory is derived *a posteriori* instead of suggested *a priori*, is an inference and not an instinct, and has perhaps never been applied as a practical criterion of duty. As in metaphysics Aristotle completely sundered God from the world, so in ethics he separated the speculative from the practical reason, and gave to morality no foundation in absolute science. His moral scheme was a branch of politics, virtue was a civil quality to be developed only in the state, and his views of man and life were not universal but essentially Greek and republican. To prove that man was something more than a member of society was a task for the future.—This task

was fulfilled by cynicism and stoicism, while the conquests of Alexander may be said to have denationalized the Greek ethica. Diogenes proclaimed himself a citizen of the world, and the government of the universe the only polity worthy of our admiration. Opposed to patriotism, family, and property, the cynic placed virtue in the strength to endure privations and in independence of social relations. Under the banner of inward freedom and power, he verged toward asceticism, misanthropy, and impudence. The same tendency more strikingly appears in stoicism, the leading feature of which is tyranny over self, a revolt against the senses and passions, contempt of pain, pleasure, death, and of all the accidents of humanity. It was the philosophy of Roman citizenship, lying underneath the inflexibility of discipline and duty. Cleanthes and Epictetus both declared force to be the only virtue. A rigorous adherence to the essential elements, the lowest terms of human nature, a contempt for pleasure as something not designed in the scheme of natural law and inconsistent with its ideal of the freedom and independence of the soul, a striving to shape the individual life according to the rational nature, which is itself in conformity with the rational order of universal nature, an abstract apprehension of virtue as the subjection of personal to universal ends, and a consequent moral indifference to external good, were the prominent characteristics of the ethical system of the stoics, which was rivalled only by Epicureanism in the amount of its influence on Greek and Roman thought and life. Its moral standpoint was one of abstract subjectivity, its scheme of particular duties was conceived with reference to an ideal of rational freedom, and its motives were all heroic. Stern, haughty, and inflexible, it disregarded the lighter graces both of inward and outward nature in its contemplation of the laws and the energy of the primitive forces of the soul. Stoicism was one of the modes of reaction against the degeneracy of Greek society; Epicureanism, another. Like Aristotle, Epicurus placed the highest good in happiness. The prize of life is the possession of supreme pleasure. All other virtues are but the auxiliaries of prudence or wisdom, which is the architect of our happiness, teaching us in whatsoever situation to derive from it the utmost advantages. Thus by prudence the wise man will abstain from the burden of public affairs and from marriage, will observe the laws of his country, acquire means to live with dignity and ease, practise sobriety and moderation, cultivate friendships, and aim after a life without a trouble (*ataraxia*). This serene pleasure he does not allow to be disturbed by fears of death or of the gods; for the gods live in changeless and blessed repose in empty space, undisturbed by any management of human affairs; and death is the end of all feeling, and not an evil to be dreaded, since when death is, we are not. His ethical system does not recognize any positive end of life, and proposes nothing higher than a state

of passionless repose; and from the multitude of his disciples during several centuries there proceeded no original thought and no preëminent man. The system itself degenerated, until it became strange that a philosopher who was proverbially blameless and temperate, who nurtured himself on barley bread and water, with which he boasted that he could rival Jupiter in happiness, should have been the founder of Epicureanism. The Horatian *nil admirari* expresses the melancholy but not the sensuality of its later character. The influence of the Platonic and Aristotelian ethical theories declined; stoicism and Epicureanism remained as rival sects. During the first Christian centuries stoicism predominated in intellectual theories, and philosophers of all schools, poets, historians, and rhetoricians, spoke like Seneca and Epictetus of the sacred love of the world, of the equality of man, of universal law, and a universal republic. Unlike the earlier philosophers, who had founded ethics on the system of the human faculties and passions with reference to their combined operation in the state, the Neo-Platonists gave a theological and mystical character to duty in connection with their doctrines of emanation. The object of life was to rise by processes of asceticism and ecstatic vision from the world of the senses into which we have fallen to our original home in the world of ideas, and the virtues which mark the successive steps in this return are distinguished as physical, political, ethical, purificative, contemplative, and theurgic.—While all antiquity had made the sovereign good consist in escape from pain, either by virtue or by pleasure, Christianity by the mystery of the passion announced the divinity of sorrow. From this time until the rise of modern philosophy ethics cannot be separated from dogmatics. During a thousand years of theological speculations on the problems of life, no system of philosophical ethics was attempted. The characteristic element in Christian virtue is love. If the Christian ideal of perfect charity were realized, ethics and politics would alike be absorbed in a higher science. Prominent as were the ideas of faith, hope, charity, and self-sacrifice in the age of the apostolic and church fathers, their basis remained from the first rather religious than speculative, notwithstanding the persuasion that in the reason enlightened by the Word was given a ground of union between objective revelation and subjective knowledge. Justin Martyr, "the evangelist in the robe of a philosopher," began to apply the forms of ancient ethical philosophy to Christian conceptions of duty, and maintained human freedom by identifying the will and the conscience. Augustine, though aiming to emancipate Christian thought from antique influences, asserted the rationality of Christian morality, since it sprang from the absolute reason of Christ, who was the central idea in philosophy and the ideal of life. While Augustine and Pelagius were debating free will and sovereign grace, the same question was discussed in a different form by the last of

the pagan philosophers, Plotinus and Proclus. The former, in a scheme of universal and absolute determination, suppressed liberty; the latter urged that the essence of personality was liberty, that man was his own controlling demon, and used the terms autokinesy and heterokinesy, corresponding nearly to the autonomy and heteronomy of Kant. The most elaborate attempt to combine the moral ideas of Christianity and of Alexandrian paganism was made by the writings ascribed to Dionysius the Areopagite, which exerted great influence on later mystical theories. In the middle ages, mysticism, scholasticism, and casuistry successively presided over the doctrines of Christian morality. St. Bernard and St. Victor were the leading representatives of mysticism. The former has been surpassed by no author in his delineations of the worth and power of love. From him proceeded that passionate inspiration, which the monastery of St. Victor perpetuated through the middle ages, and which remains embodied in the "Imitation of Christ." The two pre-eminent Christian sentiments, according to him, are humility and love, both springing from the knowledge of ourselves. A sense of humiliation is the first experience when we duly regard ourselves, and this prepares for intensity of love, which in its highest degree is felt only with reference to God. The great masters of scholastic theological ethics were Peter Lombard, Thomas Aquinas, and Duns Scotus. The aim of all was to harmonize Aristotelianism and Christianity. The first completed the list of the seven cardinal virtues by adding faith, hope, and charity to the ancient series of justice, fortitude, temperance, and wisdom. The second fully developed the mediæval philosophy of virtue. He made the intellect the highest principle, and distinguished universal and special ethics, the former being that of perfect beings in heaven, the latter that of imperfect beings on earth. Duns Scotus opposed the primacy of the will to that of the intellect, and thus introduced a subjective element in place of the objective knowledge to which Aquinas had given prominence. While by the mystical method morality was referred to inner feelings, aspirations, and conflicts, and by the scholastic method was founded on systems of intellectual principles, the casuistical method assumed prominence, which limited itself to the determination of duty in particular cases (*casus conscientie*) in practical life. Numerous works of casuistry, some of them designed for the use of the confessional, were produced from the 13th to the 16th century, the principal of which were the *Astesana* by a Minorite of Asti, the *Angelica* by Angelus de Calvasio, the *Pisanella*, also called the *Magistrucchia*, by Bartholomew de Sancta Concordia in Pisa, the *Rosella* by the Genoese Minorite Trouamala, and the *Monaldina* by Archbishop Monaldus of Benevento. The *Astesana* treated in 8 books of the divine commandments, of virtues and vices, of covenants and last wills, of the sacraments, of penance and extreme unction, of

ordination, of ecclesiastical censures, and of marriage. The tendency of casuistry was to dissipate the essential unity of the Christian life in the technical consideration of a diversity of works, and it had begun to decline when it was revived and zealously improved by the order of Jesuits, and became their peculiar ethics. The doctrine of probabilities was developed by them in connection with it. Pascal and others assailed the indefiniteness and ambiguity of casuistical principles. The *Medulla* of Hermann Busenbaum, which is the basis of the *Theologia Moralis* of Liguori, attained the highest reputation as an embodiment of Jesuitical ethics.—In the conflicts of the 16th century, when sects, schools, and parties were confounded and transformed, moral philosophy was subordinate to theology and politics. Montaigne, who of all the writers of the time was most distinctively a moralist, pretended to no system. The conciliatory Melancthon proposed a definition of virtue which includes the special features of all the schools and creeds; Suarez maintained the traditions of scholasticism; and Luther, Bruno, and Bacon, as well as the later Descartes, prepared in different ways for the achievements of a new era. One of the relics of mediæval discussion was the foundation of natural law. The disciples of Aquinas made it depend on the nature of things; those of Scotus and Occam, on the authority of God. The former made it essentially a matter of the intellect; the latter, of the will. The former tended to establish morality as independent of the Deity, and to affirm the eternal distinction between right and wrong, even if God did not exist; the latter tended to conceive of the moral law as an arbitrary enactment, to regard nothing as good or bad in itself, and the command of a superior as the only foundation of moral distinctions. The ablest representative of the latter theory in modern philosophy is Hobbes. He denied that any thing is naturally right or wrong, affirmed that pleasure and pain are the only objects to be desired or avoided, and limited human selfishness only by the control of an absolute civil power, the necessity of which is proved by experience in order to prevent a state of universal warfare. Morality is thus an artificial and prudential arrangement, dependent on the command of the political chief, without which the only virtues would be force and cunning. On the contrary, Grotius maintained moral distinctions anterior to human convention, and established the law of nature and of nations as a special department in ethical science. The idea of natural law was more precisely determined by Pufendorf, who defined it as the precept of right reason among men mutually social, making a disinterested care for the advantage of society the first duty. It does not extend beyond the limits of this life, is limited to the regulation of external acts, and exists in the nature of things and in the eternal principles of the divine reason. Leibnitz disputed each of these three propositions. The theory of Hobbes was professedly opposed by Cumber-

land, who claimed the existence of certain natural laws, independent of experience, and cognizable by right reason, which prompt us to the exercise of moral and social duties. The eternal and immutable distinction of right and wrong in the mind of God, and as pure conceptions of the human reason, was sustained by Oudworth, and was the occasion of more precise speculations in England as to the mode or faculty by which we perceive the distinction. —The ethical writings of Malebranche were the most important produced in France in the latter part of the 17th century. Virtue he defines to be the love of universal order, as it eternally existed in the divine reason, where every created reason contemplates it. Particular duties are but the applications of this love. He substituted for the ancient classification of four cardinal virtues the modern distinction of duties toward God, men, and ourselves. Spinoza, according to his opponents, by denying liberty in man and God, by recognizing only one divine substance and the modes thereof, made morality impossible, notwithstanding his principal work is entitled *Ethica*. But by defining clear ideas as those of the reason and vague ideas as those of passion, and establishing it as the object of existence to attain to clear ideas, he succeeded, like most other moralists, in opposing reason to passion. The being of the soul is thought: To increase this, to rise to a greater reality, to preserve and exalt our essential nature, is at once the highest good and the highest virtue. Knowledge is happiness, which is not the reward of virtue, but virtue itself. To follow our desires is the law of practical life, and limitation, deficiency of might, is the only evil. But evil is merely a relative conception of our own, formed by comparison of things with each other; there is no idea of it with God, who is always in harmony with himself, acting according to the laws of his own essence. —In the 18th century moral philosophy rested in England chiefly on theories of disinterested feeling and the moral sense, in France on sensationalism and self-interest; and in Germany the followers of Leibnitz maintained the supremacy of the reason and the doctrine of ideal good. Shaftesbury was the first to employ the term moral sense, which, however, he did not define. Some of his intimations favor the theory of general benevolence proposed by Edwards. Wollaston's definition of virtue as conformity to the truth of things, which Dr. Clarke changed to the fitness of things, gives to it an intellectual foundation, since truth and fitness are intellectual conceptions. Morality thus becomes the practice of reason. Hutcheson developed the suggestion of Shaftesbury of a moral sense, and supposed conscience and taste to be separate faculties which immediately introduce us to the objects of aesthetics and ethics. But neither he nor Bishop Butler, after thus determining the subjective condition of virtue, undertook to show the objective distinctive quality common to right actions. Nothing

therefore but the immediateness of moral emotion and determination is secured by their theory, since neither the moral sense nor the morality of actions is explained by the statement that they correspond to each other. Adam Smith, in referring morality to the principle of sympathy, rendered a service rather to the philosophy of the sympathetic affections than of ethics. Though perhaps no one has ever accepted his statement that moral approval depends first upon sympathy with the motives of the agent, secondly upon sympathy with the gratitude of those who have been benefited by his actions, thirdly upon a perception that his conduct has been agreeable to the general rules by which these two sympathies generally act, and fourthly upon a perception of the utility and beauty apparent in a system of behavior which tends to promote the happiness either of the individual or of society; yet his analysis of the workings of sympathy is admirably conceived and illustrated. It was a part of Hume's ethical theory that general utility constitutes a uniform ground of moral distinctions. Denying a special moral faculty, he spoke sometimes of sympathy and sometimes of benevolence as the subjective quality which prompts us to be pleased with beneficial actions. Richard Price attempted to revive the intellectual in place of the sentimental theory of virtue, claiming that not only our moral feelings but all our emotions might ultimately be referred to the reason. He regarded right and wrong as simple ideas of the mind. —The maxim of Rochefoucauld: "Our virtues lose themselves in interest, like rivers in the sea," describes the ethical theory of the French sensational philosophy. Condillac, the head of this school, regards all intellectual operations, even judgment and volition, as transformed sensations; and Helvetius, applying the theory to morals, held that self-love or interest is the exclusive motor of man, denied disinterested motives, made pleasure the only good, and referred to legislative rewards and punishments as illustrating the whole system of individual action. A superior physical organization alone gives to man his superiority to other animals. La Mettrie maintained an atheistic Epicureanism; and though Condorcet proposed as a goal the perfectibility of mankind in the present state, he looked only to physical improvement, and wished to substitute an empirical education for the ideas and sanctions of religion and morality. The materialism, atheism, and fatalism of the epoch, which saw in the universe only matter and motion, and had pleasure for its single aim and law, were most completely and logically elaborated in D'Holbach's *Système de la nature*. —The influence of Leibnitz and Wolf maintained a higher philosophy in Germany, and the latter advanced the ethical principle that we should act only with reference to making ourselves or others more complete and perfect. Moral perfection consists in the harmony of the present with the past and the future, and of ourselves with the essential nature of man. Whatsoever tends to-

ward or against this is right or wrong. Thus ethics is the science of the possible in life, as philosophy is of the possible in the whole realm of knowledge. A eudæmonistic and utilitarian school succeeded in the latter half of the 18th century, marked by subjective idealism, which made individual culture and happiness the highest principle and end, and cherished religion on the ground that it was advantageous to earthly pleasure. Basedow, Reimarus, and Steinbart were the principal representatives of this tendency, the subjective standpoint of which appears also in numerous confessions and autobiographies, like those of Rousseau.—Kant rescued ethics from the prevalent sentimental and sensational theories. "If," said he, "happiness, and not the law of inward freedom, be made the fundamental principle, there is an end to moral science." He defines ethics as the philosophy of the laws of freedom. Freedom is an *a priori* fact, an element which affirms itself in the activity of the will. The will has the capacity of entire independence or self-determination, bound only by its own autonomy. The pure reason proposes to it a universal law, which we call the moral law, and which is a categorical imperative, requiring an unconditioned obedience. This law is, in Kant's phraseology, the form of human action. Desires, passions, and material motives furnish the contents of action, and their influence constitutes the heteronomy of the will. To exclude principles that are merely of a heteronomic nature, to admit only such motives as may be transformed into universal laws of the reason, so that the autonomy of the will may be inviolate, is the essence of morality. Thus the ethical law of Kant is: "Act only on such a maxim as may also be a universal law." A reverence for the moral law, which he compares to the starry heavens, a severance of the impulses of sense from moral motives, and an estimate of virtue as a triumph over resistance, characterize the Kantian morality. Sanctity is absolute conformity to the moral law, the ideal of moral perfection. Virtue is a constant tendency and progress toward this ideal. The supreme good is the highest happiness joined to the highest virtue. Since these do not correspond in the present state, the practical reason postulates for the attainment of the first the existence of God, and for the attainment of the second the immortality of the soul.—Personal autonomy becomes still more prominent in the philosophy of Fichte. According to him, the most profound and essential truth of our existence is the perpetual striving of the mind to develop itself, to realize its own nature, to bring into actual existence all that lies potentially in its consciousness. This fundamental impulse furnishes the formal principle of ethics, the principle of absolute autonomy, the self-formed aim of being. With it is associated the impulse of nature, which strives not for fulness and freedom, but for enjoyment. Both impulses aim at a unity, and their approximation is an infinite progression. "The world," says Fichte,

"is the sensized material of our practical life, the means by which we place before us, as object, the end and aim of our existence." Destiny is the course of the moral determination of the finite rational being. The formula of ethics is therefore: "Always fulfil thy destiny," which underlies the whole theory of particular duties. The conviction of duty, or conscience, is the condition of the morality of actions. A feeling of truth and certainty is the absolute criterion of the correctness of this conviction, and never deceives, since it exists only when the empirical is in harmony with the absolute Ego. In the later form of Fichte's philosophy, its moral strictness was relieved by religious sentiment, the elements of the Ego and duty being transformed into life and love. His formula, making morality the fulfilment of destiny, is akin to the theory of Aristotle, and was adopted by Jouffroy, the principal moralist of the French eclectic school. In ethics alone Schelling scarcely departed from the principles of Fichte. In the system of Hegel, jurisprudence, ethics, and politics form the three divisions of the philosophy of mind viewed objectively. The removal of the antagonism between the universal and the particular will constitutes morality. To pursue the rational, or what is in accordance with the universal will, is right; to pursue the irrational is wrong. The three spheres in which moral purpose appears are the family, civil society, and the state. The state is the ethical whole, the highest embodiment of the moral idea, and its will should be supreme over that of the individual. He thus recurs to the ancient notion of merging ethics in politics, gives to morality a foundation of civil absolutism, and regards the rise and fall of states as historical developments of special phases of the reason. Herbart resolved ethics into aesthetics. De Wette adopted Jacobi's principle of feeling as the moral lawgiver, and stated the formula: "Live in order to live, and out of pure reverence and love of life;" and Schleiermacher founded a system of ethics in which prominence is given to personal responsibility, and the invisible kingdom of God is made the highest good.—Against the doctrines of a moral sense and of disinterested benevolence which had chiefly prevailed in English ethical philosophy from the time of Hutcheson and Butler, and which were zealously defended by Dugald Stewart, a utilitarian tendency was manifested which culminated in Jeremy Bentham. Previous to him Tucker had developed a system akin to the selfish theory, founded on Hartley's principles of association; and Paley had declared the motive to virtue to be everlasting happiness, and had resolved the art of life into that of rightly settling our habits. Bentham gave to his moral theory the name of "the greatest happiness principle," and represented the practice of virtue as the art of maximizing happiness. All moral action proceeds, according to him, from the calculation of pains and pleasures, estimated by their magnitude

and their extent. In the proper balancing of these all morality consists, and virtue and vice are absolutely nothing, merely fictitious entities, when separated from happiness and misery. His aim was to expel from ethical science the word "ought," which was claimed by Mackintosh as the simplest and most universal expression of the moral sense. "The talisman of arrogance, indolence, and ignorance," says he, "is to be found in a single word, an authoritative imposture, which in these pages it will be frequently necessary to unvail. It is the word 'ought.' If the use of the word be admissible at all, it 'ought' to be banished from the vocabulary of morals." Till this is done he proposes to neutralize its effect by the use of another potent word—"why?" Yet Whewell has remarked that it is a mere assumption to prescribe that the answer to this query must be in the language of the utilitarian theory. Bentham urged the formation of general rules of conduct, and strict conformity to them, in order to avoid the temptations of our frailty and passions; and if a reverence for virtuous maxims and precepts thus take the place in the mind of the utilitarian of the direct application of his principle, there will be little difference between him and the believer in immutable morality, since the practical rules of both will coincide.—John Stuart Mill, who acknowledges the influence of both Bentham and Comte, in the latter portion of his work on "Logic" proposes and discusses the inquiry whether ethics may not be reduced to a certain science, and principles be as definitely established in the art of life as the indisputable laws of physics. He develops the subject no further than to state that happiness, in the full meaning of the word, must be the recognized goal of existence and aim of action.—The Italian school of philosophy of the present century presents the subject of ethics in new phases. Virtue, according to Rosmini, is founded on the idea of possible being. Universal being is the absolute good and the principle of every particular good. Moral good is the absolute good in so far as it is desired by man, since it is desire which first leads him to the idea of perfection, which is elaborated into that of being. The first precept of the moral law, therefore, is to love being as such. But as the moral act must be with reference to the ultimate goal and infinite object of thought, the formula is thus transformed: "Love intelligent beings, not for themselves, but for their supreme end, which is God." Virtue consists in the conformity of intuitive and reflex knowledge, and its essential principle is truth. Obligation rests on the power of rational decision on what a person knows. Conscience is a speculative judgment on the morality of the practical judgment and on its consequences. Mamiani, also, seeks in ontology the sources of moral order. According to him, "absolute good exists," a deduction from the idea of a first infinite cause, is the fundamental principle of ethics. Virtue is the voluntary

coöperation of free and rational beings in the moral order of the universe, in which consists the absolute good, and which converges to God. Deviation, on the contrary, is evil and sin. The moral law in most general terms commands: "Do good." Duty requires the accomplishment of the part assigned to each individual in working out the supreme end of society. But beyond this fulfilment, there is a heroic virtue whose object is the greatest possible realization of good, and which consists in the appropriation of individual capacities to the general interests of society. Mamiani maintains, as a matter of history, that right intentions have never resulted in greater evil than good, but that by a preestablished harmony even a false application of a truth must result in some undesigned advantage. The law of progress reigns in the moral as in the material world, and ultimate perfection in an immortal state is the goal of humanity. Gioberti defines virtue to be the knowledge of an absolute law and the conformity of a free will to that law. Law is an idea considered in reference to the will, and an ethical must be founded on a metaphysical system. An ultimate law cannot be considered independently of religion, because it is in fact God himself. The divine will manifested in the moral imperative appears clothed with an absolute right. God as the absolute law reigning over the free human will is the condition of obligation. The ideal formula of Gioberti transferred to the department of ethics becomes: Being, by means of the human will, creates the good. The human will, preferring law to affection, creates virtue. Virtue, reconciling affection with law, creates happiness. All these Italian systems of ethics recall the ancient speculations on the subject by referring virtue ultimately to the intellect, making ontological conceptions of being the foundation of responsibility. They also connect virtue closely with religion, and give to it something of an ecclesiastical character.—See Meinert, *Allgemeine kritische Geschichte der älteren und neueren Ethik* (1800-'1); Möller, *Das absolute Princip der Ethik* (1819); Stadlin, *Geschichte der Moral-Philosophie* (1822); De Wette, *Christliche Sittenlehre* (1819-'28); Henning, *Principien der Ethik in historischer Entwicklung* (1824); Vetter, *Ueber das Verhältniss der philosophischen zur Christlichen Sittenlehre* (1834); Daub, *Vorlesungen über die Prolegomena zur theologischen Moral, und über die Principien der Ethik* (1839); Wirth, *System der Speculationen Ethik* (1841); Rothe, *Theologische Ethik* (1845); Fuchs, *System der Christlichen Sittenlehre* (1850); Gioberti, *Del buono* (1843); Baintain, *Philosophie morale* (1842); Denis, *Histoire des théories et des idées morales dans l'antiquité* (1855); Janet, *Histoire des idées morales et politiques* (1856); Mackintosh, "Dissertation on the Progress of Ethical Philosophy" (1815); Blakey, "History of Moral Science" (1848); Whewell, "History of Moral Philosophy in England" (1852); Wayland, "Elements of

Moral Science" (1885); Alexander, "Outlines of Moral Science" (1852); and Hickok, "Moral Science" (1858).

MORALES, AMBROSIO, a Spanish historian, born in Cordova in 1518, died in Alcala in 1591. After studying at the universities of Salamanca and Alcala, he entered a Jeronymite convent near Cordova, under the name of Ambrosio de Santa Paula. He subsequently became a professor at Alcala, and, on the death of Florian de Ocampo in 1570, was appointed historiographer to the crown of Castile. In this capacity he wrote a continuation of Ocampo's *Cronica general de España* down to the period of the union of the crowns of Castile and Leon (1037). The best edition of it is that published at Madrid in 1791, in 6 vols. 4to. Southey calls Morales "the Camden of Spain."

MORAT (Germ. *Murten*), a town in the Swiss canton of Freyburg, on the S. E. shore of the lake of Morat, and on the high road from Bern to Lausanne, memorable for the victory achieved there by the Swiss confederation over the formidable Burgundian army under the duke Charles the Bold, June 22, 1476. An obelisk was erected on the battle field in 1822. (See *BURGUNDY*, vol. iv. p. 116.)

MORATIN, NICOLAS FERNANDEZ, a Spanish author, born in Madrid, July 20, 1737, died there, May 11, 1780. A lawyer by profession, he was the reformer of the Spanish theatre, and, with the aid of a royal injunction, drove the miracle plays from the stage. He was the author of a comedy called *Petimetra* (1762). He published in 1764 his *Poeta*, consisting of short poems, followed in 1765 by the *Diana*, a didactic poem, and a narrative poem on the "Destruction of his Ships by Cortes." His best tragedies are *Lucrecia* and *Hormesonda*. He also wrote in prose on historical subjects. A complete collection of his works has never been made. In 1821 his son published a volume of posthumous poems, together with a life and some of his more celebrated lyrics. His dramas and prose works are extant in pamphlet form.—LEANDRO FERNANDEZ, son of the preceding, a Spanish dramatist, born in Madrid, March 10, 1760, died in Paris, June 21, 1828. He was apprenticed to a jeweller, and worked at that trade till he was 23 years old. While a child, however, he wrote verses, and at 18 obtained the second prize of the academy for a poem on the taking of Granada. In 1780 he published a satire entitled *Leccion poetica*, and in 1787, by the intervention of Jovellanos, he was made secretary to the Spanish embassy at Paris. On his return to Madrid, he published several small pieces in prose and verse, and under the patronage of Godoy was sent at the public charge to study the drama of Germany, England, Italy, and France. On his return an office in the department of foreign affairs was assigned him. About this time he published a translation of Hamlet, *El baron, La moigata*, and *El si de las niñas*, the most popular of his plays, performed for 26 nights

consecutively, reprinted 4 times in the same year, and translated into many languages. The French invasion of 1808 brought him into misfortune, and on the restoration of Ferdinand VII. his property was confiscated; but in 1814 he was again received into favor. He went back to France in 1817, but in 1820 he returned to Barcelona, where he edited his father's works, and afterward established himself in Paris. He died in poverty; his remains were removed to Madrid in 1858. A complete edition of his works has been published by the academy of history at Madrid.

MORAVIA (Slav. *Morawa*; Germ. *Mähren*), a margraviate and German crown land of Austria, situated between lat. 48° 40' and 50° 30' N., and long. 15° 10' and 18° 28' E., bounded N. and N. E. by Prussian and Austrian Silesia, E. and S. E. by Hungary, S. by Lower Austria, and W. and N. W. by Bohemia; area, 8,560 sq. m.; pop. about 2,000,000. The country is mostly mountainous, the principal ranges being the Moravian mountains, the Sudetic range with its eastern continuation the Gesenke, and the Carpathians, which respectively separate it from Bohemia, Silesia, and Hungary. The central mountains, between Brünn, the capital, and Olmütz, contain numerous caverns. The valleys and the southern districts, which are mostly level, are fertile. Moravia is traversed by numerous rivers, the principal of which are: the March or Morawa, which rises in the northern corner of the country, flows in a S., S. E., and S. W. course through its entire breadth, receiving almost all other water courses, and, after having formed a part of the Hungarian boundary, falls into the Danube; the Beczwa, E. of the March, and the Hanna, Zwittawa, Schwarza, Iglawa, and Taya, W. of it. The Oder, which flows N. E. into Silesia, has its head waters S. of the Gesenke range. The climate is comparatively mild. Moravia is in general very productive, yielding excellent grains and fruits, hemp, flax, and wine, and vast quantities of timber, iron, coal, marble, alum, vitriol, sulphur, lead, pipe clay, and some silver. The mines are of great antiquity, some of them having been known since the 8th century. The most productive are those of iron and lead. Gold and silver were formerly extracted to some extent, but little attention has been paid to these ores since the 16th century. The deposits of coal would repay much more labor than is now expended on them. The pipe clay, which in its natural state is so soft that it may easily be moulded by the hand, is much used for making meerschaums. Agriculture, grazing, manufactures, and trade are in a flourishing condition. Woollen, linen, cotton, thread, leather, arms, needles, domestic utensils, porcelain, pottery, glass, paper, beet root sugar, and chemical products are manufactured. Many railways intersect the country, connecting it with Austria, Bohemia, Silesia, and Galicia. The inhabitants are mainly of Slavic origin, including Slovaks on the confines of Hungary,

Hannaks in the fertile central region watered by the Hanna, and the Oecho-Moravians in the districts adjoining Bohemia. The Germans and Jews mostly inhabit the towns, the former being most numerous in the regions adjacent to Silesia and Austria. There are also some Wallachs and French. The bulk of the inhabitants are Roman Catholics, the number of the Protestants falling short of 60,000, and that of the Jews short of 40,000. Previous to 1848 the latter were subject to the most oppressive obligations and restrictions. The highest Roman Catholic prelate is the archbishop of Olmütz. The educational institutions of Moravia are very numerous, and the proportion of pupils exceeds that of almost all the other Austrian provinces. The highest scientific establishments are in Brünn and Olmütz. These two cities, the one situated at the confluence of the Schwarza and Zwittawa, and the other on the March, are also the capitals of the two chief administrative divisions of Moravia. Other important towns are Znaym on the Taya, Iglau on the Iglawa, Prosnitz in the Hanna district, Prerau on the Beczwa and at the junction of the Vienna and Breslau and Vienna and Olmütz railways, Kremsir on the March, Austerlitz E. of Brünn, and Nikolsburg S. of the Taya.—Before the close of the 6th century the country was successively occupied by the Quadi, the Rugii, Heruli, and Longobardi, and in the following period by Slavic tribes, who, after the decline of the kingdom of the Avars, founded the empire of Great Moravia, the name being derived from the river Morawa (March). Charlemagne conquered it, and he and his successors exacted tribute and the adoption of Christianity, of which St. Cyril became the great apostle among the Moravians. Swatopluk, who rebelled against the German emperor toward the close of the 9th century, made Moravia a powerful state; but it soon after succumbed to the combined attacks of the Magyars and Germans. Moravia was now often invaded by Poles, Magyars, Cechs, and Germans. In the 11th century it was attached to Bohemia, and about the end of the following century constituted a margraviate of the empire, though dependent as a fief upon the Bohemian crown. After numerous divisions, it came together with Bohemia into the possession of the house of Hapsburg by the death of King Louis II. of Hungary and Bohemia in the battle of Mohács (1526), his crowns being inherited by Ferdinand I. of Austria. The Austrian constitution of 1849 made it a separate crown land, as well as Austrian Silesia, which was formerly united with it, and the statistics of which are therefore omitted from this article.

MORAVIANS, also called UNITED BRETHREN, or the UNITAS FRATRUM, a church of evangelical Christians, historically and ecclesiastically distinct from the society of the "United Brethren in Christ," with whom they are often confounded. Their history proper begins with the year 1457, 60 years previous to Luther's reformation; but their preparatory history extends back

as far as the 9th century, when Christianity was introduced into Bohemia and Moravia by missionaries who came from countries in which the apostle Paul had preached the gospel and founded churches. For several centuries it is claimed that the people of Bohemia and Moravia manifested, in matters of faith, the spirit of what was afterward Protestantism, holding fast to ecclesiastical principles opposed to the injunctions of the Roman Catholic church, and submitting to the Bible as the only rule of faith and practice. The most celebrated of their reformers was John Huss (born 1373), who was burned at the stake by order of the council of Constance in 1415. As soon as the news of his death reached his native country, fierce disturbances broke out. A powerful party arose, called the Hussites, who waged war for a number of years with great fury against the imperialists. After a time the Hussites separated into two factions: the Calixtines, who insisted principally on the restoration of the cup to the laity in the Lord's supper; and the Taborites, whose aim was a general reformation of the whole church. In 1438 the council of Basel granted the celebrated "compacts" to the Bohemians, by which the most essential of their demands were nominally conceded. The Taborites refused to receive these compacts; whereupon the Calixtines turned their arms against their brethren, and totally defeated them in 1434. The Calixtines were now the national church of Bohemia, and hostilities ceased. But a party among the remnant of the Taborites, dissatisfied with what they regarded as corrupt practices in this church also, withdrew more and more from the communion of the Calixtines, and through the instrumentality of the Calixtine bishop Rokyzan, who at first favored the movement, received permission from the regent of Bohemia to settle on one of his estates, known as the barony of Lititz. This was in 1456. A considerable number of persons under the leadership of Gregory, a nephew of Rokyzan, took up their abode on this estate. In the year 1457 they organized a religious society, adopted principles of discipline, elected 28 elders to govern the society, and took the name of "Brethren and Sisters of the Law of Christ," which was afterward changed to the simpler one of "Brethren." At a later period the title *Unitas Fratrum* or "Unity of the Brethren" was adopted. Their pastors were Calixtine priests who entertained evangelical views, and who had joined the society. Such was the beginning of the Moravian church. In 1461, at the instigation of Rokyzan, who had become their inveterate enemy, a fierce persecution burst upon the Brethren, many of whom suffered martyrdom. This persecution only served to increase the number of the Brethren; and in 1467 a synod was held at Lhota, a village on the estate of Lititz, for the purpose of effecting a more complete organization. After protracted deliberations the Brethren resolved to separate entirely from the national establishment, and to

change their society into an independent church. To do this, it was necessary to institute a ministry of their own; and being anxious to secure one whose validity the Calixtines and Roman Catholics would be compelled to acknowledge, they determined to seek the episcopal succession from a colony of Waldenses, settled on the confines of Bohemia and Austria, who had obtained this succession. The Waldensian bishop Stephen, and his assistants, consecrated three men, who had been sent to him by the synod of Lhota, to the office of bishop. As soon as these events became known, new persecutions broke out; but the Brethren continued to increase notwithstanding. Toward the close of the 15th century they had more than 200 churches in Moravia and Bohemia, had published a Bohemian version of the Bible and several confessions of faith, owned two printing establishments, and were preparing a catechism and hymn book for publication. In the 16th century they sent several deputations to Luther. There were differences of opinion between them and him in respect to discipline, on which the Brethren insisted very strongly; still their intercourse, for the most part, was friendly, and when the last deputation took leave of the great reformer he bade them God speed, in these words: "Do you be the apostles of the Bohemians, as I and my brethren will be apostles of the Germans." With some other of the reformers the Brethren stood in still closer connection. Meantime their numbers and influence increased very much. They established churches in Poland, and gradually the *Unitas Fratrum* was composed of 8 provinces, the Bohemian, Moravian, and Polish, each governed by its own bishops, but all confederated as one church, holding general synods in common. In the beginning of the 17th century, the outward prosperity of the Brethren was fully established; by the "letters of majesty" of the emperor Matthias, the *Unitas Fratrum* became one of the legally acknowledged churches of the land. A remarkable work, completed some time before, was the celebrated Bohemian Bible of Oraltz, translated from the original by a committee of bishops, after a labor of 15 years. But the period of outward prosperity did not continue long. In 1621 Ferdinand II. began a series of persecutions directed against all the Protestant denominations in Bohemia and Moravia, and known as the anti-reformation. His plans were successful. Protestantism was totally overthrown in these countries, more than 50,000 of whose inhabitants emigrated. The Brethren's church ceased to exist, except in Poland; and there, in the course of a few decades, it was united with the Reformed denomination. In this way the *Unitas Fratrum*, as a distinct organization, disappeared from the eyes of men, and remained as a "hidden seed," for a period of 94 years. This seed was fostered by John Amos Comenius, the last bishop of the Moravian line, who not only published several works by which the history, doctrines, and discipline

of the Brethren were preserved, but also provided for the continuance of the episcopate. In Moravia many families remained, which secretly entertained the views of their fathers. Among these an awakening took place in the first quarter of the 18th century, through the instrumentality of a Moravian exile named Christian David. In consequence of this awakening, the desire to live in a Protestant country was felt more and more. Just 50 years after the death of Comenius, in the night of May 27, 1722, two families of Moravians escaped from their native country, and, after a journey of 11 days, safely reached Berthelsdorf, an estate in Saxony belonging to Count Zinzendorf, a pious young nobleman, who had offered them a refuge. Other Moravians soon joined them, and in 5 years a colony of 800 persons lived on Count Zinzendorf's estate. They built a town, and called it Herrnhut; introduced the discipline of their fathers, preserved by the publications of Comenius; and in 1735 obtained the episcopal succession of the *Unitas Fratrum*. In this way the ancient church was renewed. Zinzendorf soon relinquished all worldly honors, became a bishop of the Brethren, and devoted himself entirely to their service. Churches were established in various parts of the continent, in North America and Great Britain. In 1749 the British parliament acknowledged the Moravian Brethren as an episcopal church, and passed an act encouraging them to settle in the North American colonies. They devoted themselves here to missions among the Indians with great success, one of their most celebrated stations being at Gnadenhütten ("tents of grace") in Tuscarawas co., Ohio, where 100 Moravian Indians were treacherously massacred by whites, March 8, 1782, on a groundless suspicion of having been concerned in certain outrages in Pennsylvania. The numbers of the Brethren, both in America and in Europe, never increased as did those of many other denominations of Christians. This was owing to two causes. First, almost the entire strength of the renewed Moravian church was concentrated on the foreign mission field. Secondly, the fundamental principle underlying the efforts of Zinzendorf and his coadjutors, on behalf of the church at home, was Spener's idea of *ecclesiæ in ecclesiâ*—little churches within the church—households of faith whose members should be separated as much as possible from the world, and which should constitute retreats where men could hold undisturbed communion with God. This idea, carried out consistently, resulted in the establishment of Moravian settlements, that is, towns founded by the church, where no one who was not a member was permitted to own real estate, although strangers, complying with the rules of the community, were allowed to lease houses. A system so exclusive necessarily kept the church numerically small, although it undoubtedly was of great advantage in other respects, and served to foster the missionary zeal which has distinguished the Moravians. During the last 20

years great changes have taken place in the United States in respect to this system, and also in regard to the constitution of the church generally. The last general synod, held at Herrnhut in 1857, remodelled the constitution, and opened the way for a more general development of the resources of the church in the home field.—The *Unitas Fratrum* now consists of 3 provinces, the American, continental, and British, which govern themselves in all provincial matters, but are confederated as one church in respect to general principles of doctrine and practice, and the prosecution of the foreign mission work. Each province has a provincial synod, whose executive is an elective board of bishops and elders, styled the "Provincial Elders' Conference," to which the entire management of the church in provincial things, including the appointment of pastors, is intrusted in the interval between two synods. For the general government of the 3 provinces and the foreign missions, there is a general synod, which meets every 10 or 12 years, and to which each province sends the same number of delegates. The executive board of the general synod is called the "Unity's Elders' Conference," and is the highest judicatory for the whole *Unitas Fratrum*, when that synod is not in session. In the American province there are two districts, the northern and the southern, each having a synod and a provincial elders' conference. The seat of government for the northern district is at Bethlehem, Northampton co., Penn.; and for the southern, at Salem, Forsyth co., N. C. The Moravian churches in these two districts, without exception, are now like those of other Christian denominations, the exclusive system having been given up entirely. The establishments formerly found in the settlements, and known as brethren's, sisters', and widows' houses, have likewise passed away. In the British province, the seat of government is at Ockbrook, Derbyshire. Only 4 of the churches of this province are settlements. In the continental province, the old system is kept up in all respects. The governing board, which is at the same time the general board for the whole "Unity" (the name by which the *Unitas Fratrum* is generally known in Moravian phraseology), has its seat at Berthelsdorf, a village on the estate of the same name, in Saxony, about a mile from Herrnhut; it assembles for business in the castle formerly inhabited by Count Zinzendorf, who devoted his entire property to the good of the church. To a Moravian settlement on the continent of Europe still belong the institutions mentioned above, which have been given up in this country, namely, brethren's, sisters', and widows' houses. In a brethren's house, unmarried men live together, and engage in various trades and professions, the profits of which go to the church; in a sisters' house, unmarried women reside, and have an opportunity of earning a livelihood by different kinds of female work; a widows' house is a house for indigent or other

widows, where they live comfortably at a very cheap rate. Each house has a spiritual and temporal superintendent, a common refectory and dormitory (except in the case of widows' houses), and a prayer hall, where religious services are daily held. There is nothing monastic in the regulations by which these establishments are governed. The inmates remain in them entirely as their own option, and are almost invariably such as have no other home. A community of goods never existed, at any time, in a Moravian church or Moravian institution. The contrary has often been supposed, owing to the circumstance that in the last century, during the Indian wars, when the settlements of the Brethren in America were yet feeble and exposed to the attacks of the savages, it became necessary to combine the efforts of all the members for the sustenance of the community. Hence the system of "common house-keeping," as it was called, was introduced; but each person retained his own private property, and when the wars were over and the settlements secure, the system was given up. It continued only for about 15 years.—The Moravians are an evangelical church, in the fullest sense of the term, as it is commonly used in the United States. They have no confession of faith, as such; but the doctrines which they uphold are embodied in a catechism and a litany, called the Easter morning litany, and used on Easter Sunday. Catholicity eminently marks the church, in a doctrinal point of view. Its motto may be said to be that of Augustine: "In essentials unity, in non-essentials liberty, in all things charity." The distinguishing feature of Moravian theology is the prominence given to the person and atonement of Christ. He is regarded as the centre of Christian doctrine, "in whom all the promises of God are yea and amen, and in whom we have the grace of the Son, the love of the Father, and the communion of the Holy Ghost." The Moravian ministry, like that of the Protestant Episcopal church, embraces bishops, presbyters, and deacons. Bishops only have the right to ordain. They are usually appointed by lot, in imitation of the mode of appointing the apostle Matthias. The Moravian episcopacy is not prelatial; the bishops have no dioceses, and do not govern the church in virtue of their office, but only when elected to the governing boards. However, they are almost invariably members of these boards by election. The Moravian episcopal succession from 1467 to 1860 embraces 161 bishops. There are 16 bishops in office at present. Of these, 7 reside in Germany, 1 in Russia, 3 in England, 4 in the United States, and 1 in the West Indies. The ritual of the church is similar to that of the Protestant Episcopal. A litany is used, in several languages, in all the different parts of the Unity; and there are regular forms for infant and adult baptism, the sacrament of the Lord's supper, the rite of confirmation and ordination, the burial of the dead, and marriage. Love feasts, in imitation of the apoe-

tological agapæ, are celebrated; and liturgical services, particularly on the occasion of church festivals, are held in many churches. The Moravians are distinguished for their church music.—The present numerical strength of the home church is as follows: in the American province there are 34 churches, 5,800 communicants, and 8,276 souls; in the continental, 19 churches (all of which with the exception of 4 are Moravian settlements), 4,677 communicants, and 6,174 souls; in the British province, 34 churches, 2,980 communicants, and 5,184 souls. The whole number of communicants in the 8 provinces is 12,947, and of souls 19,633. Although the church is so small, it is engaged in very extensive operations. The first enterprise which deserves to be mentioned is that of education. There are 4 church boarding schools in the American province (at Nazareth, Bethlehem, and Litiz, Penn., and Salem, N. C.), at which more than 600 pupils are annually educated; 15 in the British province, educating about 400 pupils every year; and 25 in the continental province, with about 1,050 pupils. Nearly all the scholars come from beyond the pale of the church. At Bethlehem, Penn., there is a college, and in connection with it a theological seminary. Similar institutions belong to the continental province. The next enterprise is that of domestic missions. These, in the United States, were commenced very recently among the German immigrants. There are 17 missionaries in the field, and 88 stations. On the continent of Europe the enterprise is far more extensive, and peculiarly interesting. It is called the work of the *Diaspora*, from the original Greek of 1 Peter i. 1, and has for its object the evangelization of the state churches, without proselyting their members. Hence societies within these churches are formed and regulated by the missionaries, who hold meetings for prayer and exhortation, and visit from house to house, but never administer the sacraments. There are 120 missionaries, male and female, engaged in this enterprise. It extends over Saxony, Prussia, and other German countries, Switzerland, parts of France, Denmark, Norway, Sweden, and the Russian empire. In the Russian provinces of Livonia and Esthonia the cause prospers very much, there being 265 chapels, and more than 62,000 members. The whole number of *Diaspora* members, as they are called, on the continent, is about 80,000. But the great work which chiefly engages the energies of the church, and in which all the provinces unite, is that of foreign missions. It was commenced in 1732, when Herrnhut constituted the only Moravian church, numbering about 600 souls. Since then 2,087 missionaries, male and female, not counting the native assistants, have labored in this field. Unsuccessful missions were commenced in Lapland, among the Samoyeds, in Algeria, Ceylon, China, Persia, the East Indies, the Caucasus, Guiana, Guinea, among the Calmucks, in Abyssinia and Tranquebar. At the present time the church has missions in Greenland, Lab-

rador, North America (among the Indians), on the Mosquito coast, in the islands of St. Thomas, St. Croix, St. Juan, Jamaica, Antigua, St. Kitts, Barbados, and Tobago, in Surinam, South Africa, Thibet, and Australia. There are 812 missionaries in the field, not counting the native assistants; 74 regular stations, not counting the out stations; and 74,538 converts under religious instruction, of whom 53,582 are in church fellowship, including baptized children, and the rest candidates for admission.—For further information in reference to the Moravians, consult "The Moravian Manual" (Philadelphia, 1859).

MORAYSHIRE. See ELGIN.

MORAZAN, FRANCISCO, a Central American statesman and general, and the last president of the republic of Central America, born in Honduras in 1799, shot in Costa Rica, Sept. 15, 1842. His father was of Corsican extraction, although born in Porto Rico, and his mother was a lady of Honduras. He was early distinguished for impetuosity, decision, perseverance, frankness, and manly bearing. In 1824 he had risen to be secretary general of Honduras, and soon after was elected chief or governor of the state, in which position he distinguished himself both as a statesman and as a military commander. In several contests he led the liberal forces of his own and the adjacent states with unvarying success, against the reactionary party, which had resorted to armed revolt, and finally in 1829 drove them from the city of Guatemala, for which act the national congress decreed him the title of saviour of the republic. He declined the proffered post of president, and contented himself with the position of commander-in-chief of the forces, in which capacity, and in virtue of special powers delegated to him by the congress, he expelled the archbishop of Guatemala, together with the active members of the various monastic orders, suppressed the convents, abolished tithes, and directed the other property and revenues of the church to purposes of education and public charities. He now devoted himself to schemes of public improvement and education, in which, however, he was arrested in 1832, by the invasion of the republic from Mexico by a large force under Arce, the expelled president, who was seconded by various local outbreaks of his partisans. These disturbances were promptly suppressed by Morazan, who soon after, at the almost unanimous solicitation of the country, accepted the presidency. In 1836 the cholera first made its appearance, with extraordinary fatality in all parts of the country. The ignorant population, but more particularly the Indians, became much alarmed and excited, and the opportunity was seized by the clerical party to proclaim that the pestilence was due to the poisoning of the waters by the whites, liberals, and foreigners. The consequence was a general outbreak of the lower orders of the people and the Indians, who made head under the lead of Rafael Carrera. At first Morazan was able to check all these hostile demonstrations; but they rapidly became general, and in 1840 he

was compelled to fly from the country. He sought refuge in Chili, whence in 1842 he went with some followers to Costa Rica, where he was received with open arms, and raised to the governorship of the state by acclamation. Regarding himself as lawful president of the republic, he at once began to organize an army with a view to the reestablishment of the old federation; but the plan was not popular with the people of Costa Rica, and a revulsion ensued which was turned to good account by his enemies. Their plan was concerted with such secrecy that Morazan and his handful of adherents were surprised, and, after a brilliant struggle, compelled to surrender. Morazan was tried by a drum-head court martial and shot, declaring in his testament, which he was allowed but one hour to prepare, that he died "on the anniversary of the independence of his country, whose integrity he had sought to maintain, leaving no enemies, and forgiving his assassins."

MORBIHAN, a maritime department of France, in the old province of Brittany, bordering on the bay of Biscay; area, 2,626 sq. m.; pop. in 1856, 473,982. Its name is derived from a gulf formed on its shore by the Atlantic, called in the local dialect Morbihan, or small sea. The coast is indented by numerous bays and harbors. The northern districts are hilly, but the southern are mainly composed of extensive and fertile plains. The principal river is the Vilaine. The sardine fishery gives employment to more than 8,000 men. The principal minerals are iron, tin, lead, slate, and salt. There are manufactures of linen, woollens, &c. Ship building is extensively carried on in the 25 seaports of the department. The inhabitants of Morbihan are Bretons, and speak a dialect somewhat similar to that of the Cornish peasants in England. Capital, Vannes.

MORDAUNT, CHARLES. See **PETERBOROUGH, EARL OF.**

MORE, HANNAH, an English authoress, born in Stapleton, Gloucestershire, Feb. 2, 1745, died in Clifton, Sept. 7, 1838. She was the daughter of a village schoolmaster, and was educated at a seminary kept by her sisters in Bristol, in the direction of which she afterward became associated. At the age of 16 she composed a pastoral drama entitled "The Search after Happiness," which was not published however until 1778. While on a visit to London she obtained an introduction to the famous literary circle of which Johnson, Burke, Garrick, and Sir Joshua Reynolds were among the principal members. Garrick and his wife were warmly attached to her, and frequently invited her to their house. In 1774 appeared her tragedy of "The Inflexible Captive," founded on the story of Regulus, and in 1775 two legendary poems, "Sir Edred of the Bower" and "The Bleeding Rock." The tragedy of "Percy," which Garrick brought out in 1777, gave her a profit of £750, and, though marked by some of the faults of inexperience, betrayed considerable dramatic powers. "The Fatal False-

hood," played soon afterward, was less successful. About this time religious impressions induced Miss More to cease writing for the stage, and her subsequent works, with the exception of a few poems, of which the "Bas Bleu," a satire on the blue stocking club, is the best known, were generally in a more serious vein. A volume of "Sacred Dramas" (1782), "Florio," a satirical tale (1786), a "Poem on the Slave Trade" (1788), "Thoughts on the Manners of the Great" (1788), and "Religion of the Fashionable World" (1791) were among her next productions. With a view of opposing the infidel and seditious principles then somewhat in vogue, she began at Bath in 1795 a monthly periodical called the "Cheap Repository," consisting of short moral tales, among which was the "Shepherd of Salisbury Plain," written by herself. The work attained an enormous circulation. Miss More having removed to Cheddar, she founded there a number of schools, and soon extended her charitable efforts for the education of the poor into all the surrounding country. After the appearance of her "Strictures on the Modern System of Female Education" (1799), she was invited to draw up a plan of instruction for the princess Charlotte of Wales, which was published in 1805 under the title of "Hints toward forming the Character of a Young Princess." "Coelebs in Search of a Wife," her most popular work, appeared in 1809, and went through 10 editions in one year. It was followed by "Practical Piety" (1811), "Christian Morals" (1812), an "Essay on the Character and Writings of St. Paul" (1815), and "Modern Sketches" (1819). In 1828 she removed from Barleywood in Gloucestershire, where she had lived for several years with her sisters, to Clifton. She had accumulated by her writings about £80,000, one third of which she bequeathed for charitable purposes. The best edition of her works is in 11 vols. 16mo. (London, 1853).—See "Memoirs of the Life and Correspondence of Mrs. Hannah More," by William Roberts (4 vols. 8vo., London, 1834; 2 vols. 12mo., New York, 1836). The "Correspondence of Hannah More with Zachary Macaulay" (father of Lord Macaulay) was published in London in 1860.

MORE, HENRY, an English mystical divine and philosopher, born in Grantham, Lincolnshire, Oct. 12, 1614, died Sept. 1, 1687. The son of a strict Puritan, his school days at Eton were occupied by severe studies and immature speculations on the doctrine of predestination. In 1631 he removed to Christ's college, Cambridge, where he says he immersed himself over head and ears in the study of philosophy, promising himself a most wonderful happiness in it. Abandoning the Aristotelian logicians for Platonic and mystic writers, he read with delight Ficino, Plotinus, Trismegistus, and especially the *Theologia Germanica* wrongly attributed to Tauler. He took the degree of bachelor in 1635 and of master in 1639, became a fellow of his college, and passed the remainder

of his life in retirement and meditation, declining many offers of church preferment. He was private tutor to several persons of note; the rectory of Ingoldsby was resigned by him in 1642; he declined the mastership of his college in 1654, and his friend Oudworth was consequently appointed to it; and he became a prebendary of Gloucester in 1675 only in the interest of his friend Dr. Fowler. His friends once attempted to decoy him into a bishopric, but he learned their purpose while they were taking him to kiss the king's hand on occasion of his appointment, and he refused to proceed. In 1640 he published a tedious philosophical poem, entitled "Psychozoia, or the Life of the Soul." At the request of Lady Conway, a Quakeress, he wrote the *Conjectura Cabalistica*, the *Philosophia Teutonice Censura*, and other works; and she bequeathed to him a legacy of £400, which he devoted to charity. The first of these treatises was an attempt to interpret the book of Genesis into 3 distinct meanings, the literal, philosophical, and mystical or divinely moral. He wrote 4 letters to Descartes (1648-'9), which were answered by that philosopher, in which he expressed his admiration of the Cartesian system as "a fine, neat, subtle thing," but discovered defects in it, and aimed to maintain its general compatibility with the cabalistic doctrine, and its inferiority to his own principle of a divine sense. In 1656 appeared his *Enthusiasmus Triumphatus*, a discourse on the nature, causes, kinds, and cure of enthusiasm, which illustrates at once his shrewdness and his mysticism, and proves that his fancied illumination and extravagant conceits rarely prostrated his judgment. Among his other publications are *Enchiridium Metaphysicum*, displaying an intimate and extensive acquaintance with metaphysics; the "Mystery of Godliness," which enjoyed a high degree of popularity; the "Mystery of Iniquity;" a "Discourse on the Immortality of the Soul;" and a treatise entitled "Medela Mundi, or Cure of the World," which he did not live to finish. He held the opinion that the Hebrew revelation had been transmitted to Pythagoras during his travels in the East, and had been inherited from him by the Platonists, whose principles therefore were the true divine philosophy. He regarded the cabalistic speculations, also, as a corrupted offshoot from the same source. All of his writings indicate eminent erudition and acuteness. He was personally esteemed for uncommon benevolence, purity, and piety, and he was after Oudworth the ablest as well as the most amiable of the English Platonic divines of the 17th century. His principal philosophical writings appeared in English (3d ed., 1662; 4th ed., 1712), and a complete edition of his works was published in Latin (1679). His life was written by the Rev. Richard Ward (London, 1710).

MORE, Sir THOMAS, an English statesman and philosopher, born in London in 1480, executed July 6, 1535. His father was one of the justices of the court of king's bench, and was

by descent entitled to use armorial bearings, the distinctive privilege of those who then began to be called gentry. He was educated in Latin under Nicholas Hart, an eminent schoolmaster in Threadneedle street, and, according to the custom of that age for young gentlemen to spend part of their boyhood in the house of a nobleman or high ecclesiastical dignitary to profit by the conversation of experienced men and to learn the manners of the world, was placed in his 15th year in the family of Cardinal Morton, archbishop of Canterbury. There he gave brilliant proofs of natural wit, and the aged cardinal often predicted that "whosoever shall live to see it, this child will prove a marvellous rare man." In 1497 he went to Oxford as a student of Canterbury college, which afterward became Christchurch, where he was prominent as a partisan of Greek studies, against the more aged, powerful, and larger body of the university, which regarded this innovation in education with distrust. The opposing factions were styled Greeks and Trojans. He studied Greek under Grocyn, and his enthusiasm for it was increased by Erasmus, who resided at Oxford in 1497 and 1498, and formed a life-long intimacy with More. At the university, or soon after leaving it, he composed the greater part of his English verses, which sparkle with witty conceits. He also wrote Latin epigrams (Basel, 1520), which contain proofs that he always regarded government as dependent on the consent of the people. Having completed the curriculum at Oxford, he passed to the study of law successively at New Inn and at Lincoln's Inn, London, at the same time delivering lectures on jurisprudence at Farnival's Inn, and on Augustine's *De Civitate Dei*, or the divine government of the moral world, at St. Laurence's church. To the latter lectures "all the chief learned of the city" are stated to have resorted. He meditated taking holy orders, associated with the Carthusian monks of the Charterhouse, and manifested a predilection for monastic life, some of the severest austerities of which he inflicted upon himself; but he soon relinquished the project, and resolved on marriage. Of the 3 daughters of Mr. Colt, a gentleman of Essex, the second seemed to him the fairest; but when he considered the slight and consequent grief to the eldest sister if the younger were preferred to her in marriage, he then "of a certain pity framed his fancy" to the former, and soon after married her. Called to the bar, he quickly rose to professional eminence, his practice amounting in 1509 to £400 a year, about equal to an income of £5,000 at the present time. Mackintosh calls him the first person in English history distinguished for the faculty of public speaking, and remarkable for the successful employment of it against a lavish grant of money to the crown. He was employed in nearly every important case brought before the courts, was appointed to the office of judge of the sheriff's court for London and Middlesex, was elected a burgess of

the parliament under Henry VII., and his eloquence both at the bar and in parliament was in eminent instances successful against the claims of the crown. His brilliant and effective opposition to a royal grant, causing Henry VII. to declare that "a beardless boy had disappointed all his purpose," drew a fine and imprisonment upon his father; and he himself had resolved to leave the country at the time of that monarch's death. (There is little information concerning the style of his oratory.) Erasmus refers to his fertile invention, untiring attention, simplicity, promptitude, and an acuteness so preëminent that he often perplexed the greatest theologians in their own province. In his prose writings, but a very small part of his vocabulary has been superannuated; but the structure of his sentences is according to the genius of the Latin rather than the English language, and differs widely from that which has since prevailed. His fragmentary "History of Richard III." (1641) is the first example of classical English prose, and abounds in skillfully constructed speeches after the manner of ancient histories. The work by which he is chiefly known as an author is his *Utopia*, published in Latin (Louvain, 1516), and soon translated into English, French, Dutch, and Italian. It is an account of an imaginary commonwealth in the island of Utopia, feigned to have been discovered by a companion of Amerigo Vespucci, from whom More learns the tale. In this perfect society, all are contented with the necessities of life, all engage in useful labor for 6 hours a day, and indolence, avarice, and want are unknown. With impracticable theories, the work expresses wide and tolerant opinions in advance of the age, and is pervaded by a sense of justice and humanity and by censures on the vices of power that are remarkable in a courtier of Henry VIII. Thus, one of the oldest laws of the Utopians is stated to be that no man should be punished for his religion, "it being a fundamental opinion among them that a man cannot make himself believe any thing he pleases." How far the various doctrines and projects contained in the *Utopia* were regarded by him with approbation, or were merely the paradoxes of a playful mind, cannot be determined. His public life had already begun. In 1514 and 1515 he was sent on two embassies to the Netherlands with reference to commercial intercourse. In 1516 he became a privy councillor and a favorite of the king, with whom he advised, jested, and discussed divinity, astronomy, and other sciences. In his leisure he corresponded with Erasmus and other men of letters of the highest eminence. In 1521 he was knighted and made treasurer of the exchequer, and at various times he was employed in France to manage the intrigues of Wolsey with Francis I. When parliament assembled in 1523, he was chosen speaker of the house of commons, and displayed his tact and quiet firmness when the house by its silence refused a heavy grant which Cardinal Wolsey had ap-

peared in state to demand. In 1525 he was appointed chancellor of the duchy of Lancaster; in 1527 he accompanied Wolsey on his magnificent embassy to France; and about this time he proved his attachment to the old form of religion by several learned, witty, and bitter pamphlets against the reformers. He succeeded to the lord chancellorship in 1529, after the fall of Wolsey, and in this position evaded the demand of the king for an opinion concerning his divorce from Queen Catharine. Froude, the last historian of this epoch, cites several cases to prove that in his official efforts for the suppression of heretics he not merely zealously executed a cruel law, but that he disregarded some of his obligations as judge. "The philosopher of the Utopia," he says, "the friend of Erasmus, whose life was of blameless beauty, whose genius was cultivated to the highest attainable perfection, was to prove to the world that the spirit of persecution is no peculiar attribute of the pedant, the bigot, or the fanatic, but may coexist with the fairest graces of the human character." The charges against him were partially denied in his "Apology," written in 1538. He constantly refused to lend his authority to the king's project of divorce and second marriage; and after holding the great seal for 2½ years, he determined no longer to countenance by his official position measures which he intensely disapproved and deplored, and obtained permission to resign. In his house at Chelsea he lived in retirement, making ready for evil times. Implicated in the alleged imposture of the nun of Kent, whom he believed to be inspired, he was yet in the investigation treated leniently. When at length in 1534 he was required to swear allegiance to the act of succession for securing the throne to the offspring of Anne Boleyn, he refused, and was committed to the tower for misprision of treason, where he remained more than a year, with permission to receive his relatives and correspond with his friends. A deputation then waited on him to urge his acknowledgment of the royal supremacy, but he declined to answer. The council still hesitated, and interrogated him again and again in subsequent interviews; but finally (July 1, 1535) he was brought to the bar of the high commission charged with traitorously imagining and attempting to deprive the king of his title as supreme head of the church. He was condemned, and returned to the tower. On the morning of his execution he dressed in his most elaborate costume, preserved the amenity and composure of his character to the last, and, as the fatal stroke was about to fall, signed for a moment's delay while he moved aside his beard, murmuring: "Pity that should be cut; that has not committed treason." "With which strange words," says Froude, "the strangest perhaps ever uttered at such a time, the lips most famous through Europe for eloquence and wisdom closed for ever."—The best English translation of the *Utopia* is by Bishop Burnet. A collection of More's Latin works was pub-

lished at Louvain in 1556, and of his English works at London in 1557. There are biographies by his son-in-law Roper (1626), Hoddesden (1652), his great-grandson Thomas More (1796), and Sir James Mackintosh in the "Cabinet Cyclopædia" (1831).

MOREA. See PELOPONNESUS.

MOREAU, JEAN VICTOR, a French general, born in Morlaix, Aug. 11, 1768, died at Laun, Bohemia, Sept. 2, 1818. He was destined for the profession of his father, who was an attorney, studied law at Rennes, and in 1787 was made provost of the school. He supported the parliament in their opposition to the crown; but perceiving that they were struggling for mere selfish purposes, he exerted his influence against them, and became the leader of the revolutionary party at Rennes. In 1792, at the head of a battalion of volunteers, he joined the army of the north, and distinguished himself on many occasions by courage, self-possession, and military skill. He was rapidly promoted, being made a brigadier-general in 1793, and general of division in 1794. Placed in command of the right wing of the army under Pichegru, he had an important share in the conquest of Holland, the whole credit of which however was given to his superior. In the campaign of 1796, while Bonaparte was accomplishing wonders in northern Italy, and Jourdan invading Germany through the valley of the Main, Moreau, at the head of the army of the Rhine, crossed the river at Strasbourg, marched toward the Black forest, drove back the Austrian troops, defeated the archduke Charles at Neresheim, Aug. 10, and penetrated to the centre of Bavaria; but hearing of the defeat which Jourdan had experienced at Würzburg, and being aware that the archduke with all the Austrian forces in Germany was falling back upon him, he thought prudent to retreat. He accomplished this in a masterly manner in the face of two powerful armies, whom he never suffered to molest him, and even attacked with success on several occasions; so that on arriving in Alsace after an orderly march of 26 days, his own force was unimpaired, and he had moreover 18 guns taken from the enemy, 2 standards, and nearly 7,000 prisoners. In the following year he recrossed the Rhine, took the fortress of Kehl, and was preparing to proceed, when he was stopped by news of the preliminaries of Leoben. He was suspected on account of his friendship to the traitor Pichegru, and for 18 months remained out of service. The directorial government recalled him in the day of danger. Sent to northern Italy under the incapable Scherer, who left him in command of the French troops when every thing seemed to be lost, he was defeated at Cassano, April 28, 1799, and performed a retreat from the banks of the Adda first to Turin, and then to Genoa, which, though less famous, is perhaps more admirable than that of 1796. He now manoeuvred to protect the return of Macdonald from central Italy; but this general having been defeated on the banks of

the Trebia, both were superseded by Joubert, under whom Moreau consented to serve. Joubert being killed at Novi, the task of saving the remnant of the French army again devolved upon Moreau, whose energy and prudence were equal to the emergency. He had meanwhile been appointed commander of the army on the Rhine. Passing through Paris, he became acquainted with Bonaparte, and assisted him on the 18th Brumaire by watching over the two reluctant directors who were kept prisoners in the Luxembourg palace. While Bonaparte was executing the brilliant campaign which ended with the victory of Marengo, Moreau, who had crossed the Rhine, April 25, 1800, had several successful contests with the Austrians, drove Gen. Kray across the Danube, won the decisive battle of Hohenlinden, advanced as far as Munich, and on July 15 signed the armistice of Parsdorf. Austria showing a disinclination to a definite arrangement, and being encouraged by England to keep up the war, a winter campaign was required to bring her to terms. Moreau, with an army of 100,000 men, received orders to cross the Inn and march to Vienna. On Dec. 8 he met the Austrians under the archduke John at Hohenlinden, where he won a brilliant victory. He followed it up with decision and activity, crossed the Inn, the Salza, and the Traun, defeated the archduke Charles at Lambach, occupied Linz on the Danube and Steyer on the Enns, and was within two days' march of Vienna when the emperor consented to the terms proposed by the first consul, and signed the treaty of Lunéville, Feb. 9, 1801. On his return to Paris, Moreau married; and yielding to the influence of his wife and mother-in-law, who persuaded him that he was not treated as he deserved to be, he gave free expression to his discontent, and was privy to, if not deeply concerned in, the conspiracy of Georges Cadoudal and Pichegru in 1804. For this he was sentenced by a court martial to two years' imprisonment, which Bonaparte commuted to exile. Moreau came to the United States, and engaged in agricultural pursuits. At the end of 9 years Alexander I. of Russia invited him to return to Europe, and on his arrival gave him a flattering welcome. He was induced by the czar to devise, in conjunction with another French soldier who had also deserted the cause of Napoleon, a plan for the invasion of France. He became a bosom companion of Alexander; he was near him at the battle of Dresden, Aug. 27, 1813, and was advising upon a certain manoeuvre on a hill near Räcknitz, when a cannon ball from Napoleon's guard broke both his legs. He was carried to an adjoining village in Bohemia, and died 5 days later. Prince Reppin caused a monument to be erected upon the hill where he was wounded, and his remains were interred in St. Petersburg. A monument was dedicated to him in Paris in 1819. The *Vie politique, militaire et privée du général Moreau* was published by A. de Beauchamp (8vo., Paris, 1814); but the best account of him is found in

Thiers' *Histoire de la révolution Française*, and *Histoire du consulat et de l'empire*.

MOREAU DE JONNES, ALEXANDRE, a French statistician, born near Rennes, March 19, 1778. He enlisted in 1792 as a volunteer in the revolutionary army, served in many of the campaigns of the republic and the empire, and was made a prisoner in 1809. After recovering his liberty, he rejoined the army, but left it after the restoration. From that time he devoted himself to the study of statistics, and in 1817 he was appointed editor of the *Statistique générale de la France*, published under the auspices of the government. He has been for the last 44 years corresponding member of the academy of sciences, and in 1847 he became an honorary member of the academy of moral and political sciences. After the *coup d'état* of Dec. 2, 1851, he withdrew from public service on his retiring pension. He is the author of many works on statistics, which enjoy a high reputation.

MOREHOUSE, a N. parish of La., bordering on Arkansas, bounded W. by the Washita, and drained by Bartholomew and Bœuf rivers; area, 950 sq. m.; pop. in 1858, 5,426, of whom 2,698 were slaves. It has an undulating surface subject to be submerged, with a fertile soil. The productions in 1850 were 119,385 bushels of corn, 25,925 of sweet potatoes, and 3,803 bales of cotton. Capital, Bastrop.

MOREL, CHRISTOPHE ÉDOUARD, a French teacher of deaf mutes, born in Bouxwiller, department of Bas-Rhin, Dec. 5, 1805, died in Bordeaux, Feb. 28, 1857. His mother was the sister of the first baron de Gerando, under whose superintendence he was educated. He was graduated at the college of Besançon, and in 1824 connected himself with the royal institution for deaf mutes at Paris. In 1826 De Gerando, then at the head of the administrative board of that institution, confided to Morel the task of preparing "circulars" (which were really large volumes) giving information respecting the instruction of deaf mutes and the management of institutions for their training. They were published by the Paris institution, the first in 1827, and the fourth and last in 1836. In 1844 Morel undertook, on his own responsibility, the publication of the quarterly *Annales des sourds-muets et des aveugles*, which was continued for 8 years. In 1845 the *classe de perfectionnement* of the Paris institution, answering to the high class in American institutions, which had been endowed by Dr. Itard, was organized, and M. Morel at once placed in charge of it. In 1847 he took an active part in the establishment of a society for the aid of blind workmen, and in 1849 assisted in organizing the central society of education and aid for deaf mutes in France. In 1850 he was made director of the institution for deaf mutes at Bordeaux; but his health soon failed, and he passed more than 6 years previous to his death in severe suffering.

MORELLA, COUNT DE. See CARRERA, RAMON.

MORELOS, JOSÉ MARIA, a Mexican revolutionist, born in the latter part of the 18th cen-

tury, shot in the city of Mexico, Dec. 22, 1815. He was curate of Nocupetaro in Valladolid, and in Oct. 1810, joined the insurgent chief Hidalgo, who was then in arms against the Spaniards, and who gave him a commission to act as captain-general of the provinces on the S. W. coast. He set out with 5 negroes to conquer Acapulco, which was garrisoned by a large body of troops. On his march he was joined by about 1,000 men, chiefly negro slaves, with whom under cover of night he surprised and signally defeated the Spaniards, Jan. 25, 1811. The rest of the year he spent in successful partisan warfare, during which he was joined by Galeano, Matamoros, Nicolas Bravo, afterward president, and several other men of distinguished talent. His army, which was mostly composed of negroes, at length acquired by experience sufficient discipline to be openly led against the royal forces, and Morelos accordingly marched upon the capital. He encountered the Spanish army at Cuautla Amilpas, 65 m. from Mexico, Feb. 19, 1812, and defeated it after a hard-fought battle, in which the royalists lost 500 men. A second army was sent against him, and for several weeks he was besieged in Cuautla, which he defended with great spirit, and from which he skilfully withdrew his troops May 2, in the face of a greatly superior force. Subsequently he won several victories over the Spanish troops, captured Tehuacan, Orizaba, and Oajaca, and at length compelled Acapulco to surrender, Aug. 30, 1813. In December of the same year he marched against Valladolid, but was defeated there by Iturbide with great loss. From this time he suffered a succession of defeats, till on Nov. 5, 1815, he was taken prisoner after a gallant resistance against an overwhelming force, and was carried to Mexico, tried, and executed.

MORETQ, AGUSTIN, a Spanish dramatist, born at the end of the 16th or beginning of the 17th century, died in Toledo, Oct. 28, 1669. He was descended from an ancient Valencian family, and was prominent as a writer for the stage until the last 12 years of his life, which he passed in religious retirement as rector of the hospital *del refugio* of Toledo. He was a friend of Lope de Vega and Calderon and an imitator of their productions. "Of those that divided the favor of the public with their great master," says Mr. Ticknor, "none stood so near to him as Agustin Moreto." His works comprise a small number of religious and heroic plays, and some serious dramas, as *El valiente justiciero*, and *La fuerza de la sangre*. His most popular comedy, *Desden con el desden* ("Disdain met with Disdain"), is reckoned among the 4 classic productions of the Spanish drama, and was adapted for the French stage by Molière (*Princess d'Élide*), for the Italian by Carlo Gozzi (*Principessa filosofa, o il contraveleno*), and for the German by Joseph Schreyvogel (West), under the title of *Dona Diana*. The most complete edition of his comedies was issued between 1677 and 1681, though not including them all.

MORETTO, IL. See BONVICINO.

MORFIT, CAMPBELL, an American chemist, born in Heroulanum, Mo., in 1830. He studied at Columbian college, Washington, D. C., but was prevented by delicate health from completing the course, and devoted himself to the study of chemistry in the laboratory of Prof. James C. Booth of Philadelphia. He then entered a laboratory for the manufacture of commercial chemicals, and became eventually the proprietor of it, obtaining for his products medals from the Franklin and American institutes. In 1848 he became co-editor with Prof. Booth of the "Encyclopædia of Chemistry." Of his many contributions to journals, the principal are papers upon guano, salts, sugars, the analysis of coals, gum mezquite, and glycerina. He also wrote a report upon gun metal to the U. S. ordnance department. For the investigations to which this latter refers he established a laboratory at the Pikesville arsenal, Md., upon his own plan. During this time he originated the chemical department of the Maryland institute, but declined to take charge of it. The honorary degree of M.D. has been conferred upon him by the university of Maryland and the New York medical college. He filled the chair of analytical and applied chemistry in the university of Maryland from 1854 to 1858; which post he resigned to remove to New York, where he now resides. He is chiefly distinguished in technical and analytical chemistry; and his principal works are: "Applied Chemistry in the Manufacture of Soap and Candles" (Philadelphia, 1847); "Chemical and Pharmaceutical Manipulations" (1848); "The Arts of Tanning and Currying," from the French, with additions (1853); "Perfumery, its Manufacture and Use" (1855); and a report of the "Progress of the Chemical Arts," prepared with Prof. Booth for the Smithsonian institution, by which it was published in 1851.

MORGAGNI, GIOVANNI BATTISTA, an Italian anatomist, born in Forlì, Feb. 25, 1682, died in Padua, Dec. 6, 1771. After taking his degree of M.D. at Bologna, he repaired to Venice and ultimately to Padua, where in 1712 he became professor of the theory of physic; and in 1715, as successor of Molinetti, he was appointed to the principal anatomical chair in the same institution, which he continued to occupy till his death. He was the first to show the importance of anatomy as being the basis of all other medical studies, and is regarded as the founder of pathological anatomy. His most celebrated works are: *Adversaria Anatomica* (4to., Padua, 1719), afterward enlarged and published under the title of *Adversaria Omnia* (6 vols., Padua, 1741); and particularly his *De Sedibus et Causis Morborum per Anatomiam Indagatis* (3 vols. fol., 1761; last ed., 6 vols., Leipzig, 1827), which has been translated into various European languages.

MORGAN, the name of counties in 9 of the United States. I. A N. co. of Va., separated from Md. by the Potomac, and drained by Occoquan river and Sleepy creek; area, 850 sq. m.;

pop. in 1850, 8,557, of whom 128 were slaves. The surface is mountainous, and the soil light and unproductive except in the valleys. There are large deposits of iron and coal. Berkley Springs in this county is one of the oldest watering places in the United States. The productions in 1850 were 44,247 bushels of Indian corn, 40,584 of wheat, and 16,883 of oats. There were 7 grist and saw mills, 11 churches, and 645 pupils attending public schools. The Baltimore and Ohio railroad and the Chesapeake and Ohio canal follow the course of the Potomac through the county. Value of real estate in 1856, \$797,152, showing an increase over 1850 of 6 per cent. Capital, Bath. II. A central co. of Ga., bounded E. by Appalachee and Oconee rivers, and drained by their branches; area, 272 sq. m.; pop. in 1859, 9,679, of whom 6,779 were slaves. The surface is undulating, and the soil is fertile and based on limestone. Small quantities of gold have been found, and there are large quarries of granite. The productions in 1850 were 411,857 bushels of Indian corn, 86,990 of oats, 66,299 of sweet potatoes, and 11,541 bales of cotton. There were 12 grist mills, 6 saw mills, 8 tanneries, 19 churches, and 517 pupils attending public schools. The Georgia railroad passes through Madison, the capital. III. A N. co. of Ala., bounded N. by the Tennessee river; area, 720 sq. m.; pop. in 1850, 10,125, of whom 8,437 were slaves. The surface is mountainous, and the soil generally fertile. The productions in 1850 were 4,767 bales of cotton, 464,440 bushels of Indian corn, and 56,846 of oats. There were 17 churches, and 172 pupils attending public schools. The Memphis and Charleston railroad passes through the N. part of the county. Capital, Somerville. IV. A N. E. co. of Tenn., drained by the head streams of Emory's river; area, 640 sq. m.; pop. in 1850, 8,430, of whom 101 were slaves. The surface is diversified by mountains, covered with large forests. There are extensive beds of coal. The productions in 1850 were 108,522 bushels of Indian corn, 18,874 of oats, and 31,184 lbs. of butter. Capital, Morgan Court House. V. An E. co. of Ky., intersected by Licking river; area, 806 sq. m.; pop. in 1850, 7,620, of whom 187 were slaves. The surface is hilly, and the soil is rich in the valleys. Timber is abundant, and iron, coal, alum, copperas, and oil springs are found. The productions in 1850 were 267,275 bushels of Indian corn, 23,705 of oats, and 16,968 lbs. of wool. There were 6 grist mills, 14 churches, and 558 pupils attending public schools. Capital, West Liberty. VI. A S. E. co. of O., intersected by Muskingum river; area, 860 sq. m.; pop. in 1850, 28,585. It has an uneven surface and a rich soil, based on limestone. Large quantities of salt are procured in this county. In 1850 the productions were 266,236 bushels of wheat, 570,896 of Indian corn, 162,818 of oats, and 421,144 lbs. of tobacco. There were 11 grist mills, 24 saw mills, 72 churches, 2 newspaper offices, and 5,905 pupils attending public schools. Capital, McCon-

nellsville. VII. A central co. of Ind., drained by the W. fork of White river and its branches; area, 453 sq. m.; pop. in 1850, 14,576. The surface in the S. is uneven, in other parts level, and the soil is fertile. The productions in 1850 were 1,218,153 bushels of Indian corn, 93,850 of wheat, 92,881 of oats, 44,595 lbs. of wool, and 2,688 tons of hay. There were 54 churches, and 2,090 pupils attending public schools. Capital, Martinsville. VIII. A W. co. of Ill., bounded W. by the Illinois river, and drained by several creeks which afford water power; area, 650 sq. m.; pop. in 1855, 17,785. The surface consists chiefly of rich level prairies diversified by small groves. The soil is a deep black loam, and coal is abundant. The productions in 1850 were 2,693,021 bushels of Indian corn, 91,458 of wheat, 154,805 of oats, 398,180 lbs. of butter, 54,648 of wool, and 9,723 tons of hay. There were 13 grist mills, 6 saw mills, 88 churches, and 1,500 pupils attending public schools. The great western railroad passes through Jacksonville, the capital. IX. A central co. of Mo., bounded S. in part by Osage river, and drained by some of its tributaries; area, 648 sq. m.; pop. in 1856, 5,767, of whom 531 were slaves. The surface is diversified, and in some places well wooded. The soil is generally fertile. Lead, coal, and limestone are found. The productions in 1850 were 294,015 bushels of Indian corn, 11,933 of wheat, 54,272 of oats, and 60,108 lbs. of butter. There were 10 churches, and 280 pupils attending public schools. Capital, Versailles.

MORGAN, DANIEL, an American revolutionary general, born in New Jersey in 1736, died in Winchester, Va., July 6, 1802. He was of humble parentage, and in early life removed to Frederic, now Clarke co., Va. In 1755 he joined the expedition of Braddock as a teamster, and for some real or fancied indignity to a British officer received 500 lashes. He was accustomed, however, in after life jestingly to maintain that the drummer had miscounted the number and still owed him one. He also received a painful wound which disfigured his countenance for life. Returning to Frederic, he pursued the rough life of a backwoods farmer until the outbreak of the revolution, when, in command of a company of riflemen, all of whom like himself were expert marksmen, he started for Boston, reaching the American camp, after a march of 600 miles, in 3 weeks. In the latter part of 1775 he accompanied the expedition of Arnold to Quebec, and participated in the attack on that city on Dec. 31. Although successful in that part of the field where he held command, he was compelled by the fall of Montgomery and the defeat of his division to surrender. During his captivity he declined the offer of a colonelcy in the British army, and soon after his release, toward the close of 1776, was appointed colonel of a rifle regiment. During Washington's retreat through New Jersey in 1776 and the campaign in the same state in 1777, he rendered valuable services, and in the summer of

the latter year joined Gates, then in command of the northern army. In the battle of Bemis's heights, which precipitated the surrender of Burgoyne, Morgan's riflemen took a distinguished part; yet their leader was unnoticed by Gates in his official account of the occurrence, and an attempt was even made to induce him to join the Conway cabal against Washington, which he scornfully repelled. Continuing in active service in the north until the summer of 1780, Morgan was then made brigadier-general and transferred to the southern army, which he reached subsequent to the defeat of Gates at Camden. Under Gates's successor, Greene, he acted with his accustomed energy, gaining a decisive victory over Tarleton at the Cowpens, Jan. 17, 1781, for which he received a gold medal from congress, and following it up by a series of well conceived manœuvres which seriously embarrassed Cornwallis. But before the close of the campaign he was compelled by repeated and severe attacks of rheumatism to retire to his home in Virginia. In 1794 he aided in quelling the whiskey insurrection in Pennsylvania, and was a member of congress from 1795 to 1799. The latter part of his life was passed in much physical suffering.

MORGAN, SIR HENRY, a buccaneer of the 17th century, was the son of a farmer in Wales. For many years he maintained his position among the West India islands as chief of a host of pirates, composed of adventurers from all the nations of Europe. From his strongholds, one of which was the island of St. Catharine's, he made many successful descents upon the Spanish settlements in his vicinity, and at sea captured many rich prizes. The most daring of these expeditions was in 1686, in which with about 1,200 followers he took and plundered both Porto Bello and Panama, and by which he amassed a large fortune. He afterward settled at Jamaica, of which island he was appointed lieutenant-governor, and knighted, by Charles II.

MORGAN, SYDNEY (OWENSON), lady, an Irish authoress, born about 1780, died in London, April 18, 1859. From her father, an actor, and a man of considerable literary acquirements, she inherited a taste for literature. In 1797 appeared her first publication, a volume of poems, followed by a collection of Irish songs, once very popular, and "The Lays of an Irish Harp," of which a second edition was printed in 1807. Her next literary ventures were two tales, "St. Clair" and "The Novice of St. Dominick," succeeded in 1801 by "The Wild Irish Girl," a work which chimed in very happily with the taste of the time, and introduced her to the most fashionable literary circles of England. So popular did the novel become, that upward of 7 editions of it were printed in 2 years. In 1807 appeared her "Patriotic Sketches of Ireland;" in 1808, "Woman, or Ida of Athens;" and in 1809, "The Missionary." In 1811 she was married to Sir T. Charles Morgan, with whom she subsequently travelled over various parts of Europe, residing for considerable

periods in France and Italy. Among the results of her travels was a review of the social state of France (4to., London, 1817), which engendered controversy respecting the accuracy of her judgments. A similar work on Italy, composed from a journal kept during a residence in that country in 1819-'20 (3 vols. 8vo., London, 1821), was also the cause of much controversy, in which, as in the case of her work on France, by her wit and sprightliness she frequently got the better of her adversaries. As recently as 1851 she published a reply to some comments by Cardinal Wiseman on statements made in this book respecting the chair of St. Peter deposited in the cathedral at Rome. Among her remaining works were her novels, "O'Donnell," "Florence Macarthy," and "The O'Briens and the O'Flahertys;" "The Life and Times of Salvator Rosa" (1824), "Woman and her Master" (1840), "Passages from my Autobiography" (1858), &c. As a conversationist Lady Morgan was one of the most brilliant of her time, and by her tact, ready sympathy, and unvarying cheerfulness acquired and long maintained a position in the most distinguished society of Britain. Without remarkable personal attractions, she knew society thoroughly, and even in old age exercised a singular fascination over those admitted to her circle. She was the survivor of that cluster of literary women who flourished in England in the early part of the present century, and passed the latter years of her life at her residence in London, in the enjoyment of a pension of £800 conferred upon her during the ministry of Earl Grey. In 1860 appeared a memoir of her, entitled "Lady Morgan, her Career, Literary and Personal," by William J. Fitzpatrick.—SIR THOMAS CHARLES, an English physician and author, husband of the preceding, born about 1788, died Aug. 28, 1843. He was educated at Eton and Cambridge, and in 1809 took his degree of M.D. Soon after his marriage with Miss Owen, he took up his residence in Ireland, having a place under government as a commissioner of the Irish fisheries. He gradually relinquished his profession for the pursuit of literature, and was an industrious contributor to the "New Monthly Magazine" and other periodicals. He is the author of "Sketches of the Philosophy of Life" (1818), and "Sketches of the Philosophy of Morals" (1822), and published in conjunction with his wife a collection of essays and miscellanies under the title of "The Book without a Name" (1841). He also furnished some appendices to Lady Morgan's work on France.

MORGAN, WILLIAM. See ANTI-MASONRY.

MORGANA. See FATA MORGANA.

MORGANATIO MARRIAGE (Ang. Sax. *morgan gifu*, Germ. *Morgengabe*, morning gift or dowry), the term for a marriage concluded between a man of superior and a woman of inferior rank, in which it is stipulated that the latter and her children shall be entitled neither to the rank nor to the possessions of the husband, the dowry (morning gift) being in lieu of all other

privileges. Marriages of this kind are not infrequent in the princely houses of Germany, and one of the most noted was that of King Frederic William III. of Prussia with the countess Augusta von Harraoh, who thereupon received the title of princess of Liegnitz.

MORGARTEN, a hill in Switzerland, about 2 m. W. of Rothenthurm, on the margin of the lake of Egeri, on the confines of the canton of Zug, memorable as the scene of the battle of Nov. 15, 1815, in which a small body of Swiss mountaineers from Schwytz, Uri, and Unterwalden, ill armed and undisciplined, totally vanquished an Austrian army of 20,000 under the archduke Leopold. This was the first victory achieved by the Swiss in their struggle for freedom. A chapel stands at the foot of the hill, in which service is performed annually on the anniversary of the battle.

MORGHEN, RAFFAELLO SANZIO, an Italian engraver, born in Florence, June 19, 1758, died there, April 8, 1833. He was instructed by his father, an engraver, in the principles of his art, and at 20 years of age executed a series of plates representing masks from the carnival of Naples. He was then placed in the school of Volpato in Rome, and in 1781 married the only daughter of his master, whom he assisted on several important works; and in 1787 he produced his fine engraving of Guido's "Aurora" in the Rospigliosi palace at Rome. In 1790 he visited Naples, whence, notwithstanding many flattering inducements to remain held out to him by the court, he removed in 1798 to Florence, and opened a public school of engraving, receiving at the same time a pension of 400 scudi from the grand duke. His first important work in Florence was the print of Raphael's *Madonna della seggiola*, and in 1795 he commenced the *Madonna del sacco* of Andrea del Sarto, and the "Transfiguration" of Raphael, the latter his most elaborate work. He had partially finished the plate from a drawing by A. del Era, when a comparison of the copy with the original showed so many faults in the former that he was induced to abandon the work and commence another plate from a drawing by Tofanelli, which was completed in 1812 and dedicated to the emperor Napoleon. Notwithstanding the labor bestowed upon it, this is considered a less meritorious work of art than his print of the "Last Supper" after Leonardo da Vinci, the early impressions of which are among the most precious productions of the graver. According to his pupil Palmerini, Morghen executed 73 portraits, many of which were of living personages beside the great poets and painters of Italy, 47 biblical and religious pieces, 44 historical and mythological pieces, 24 views and landscapes, and 18 vignettes and crests. The Palmerini collection of prints by him is probably the most perfect in existence.

MORHOF, DANIEL GEORGE, a German scholar, born in Wismar, Feb. 6, 1689, died in Ltbeck, June 30, 1691. He was professor of poetry at Rostock and Kiel, and afterward taught also his-

tory and superintended the library in the last named university. He was a man of great learning for his time, and his principal work, *Polyhistor* (Lübeck, 1688), opened a new era in the study of literary history in Germany, and was for a long time a standard work.

MORIAH, MOUNT. See JERUSALEM.

MORIER, JAMES, an English author, born about 1780, died in Brighton in March, 1849. He was descended from a family from French Switzerland, who had settled in England. He studied the oriental languages, spent about 6 years in Persia as secretary of legation and minister plenipotentiary, and published "Travels in Persia, Armenia, and Asia Minor to Constantinople" (London, 1812); "A Second Journey through Persia, Armenia, and Asia Minor" (1818); and a series of novels, the most interesting of which is "The Adventures of Hajji Baba" (5 vols., 1824-'8). Among his other works are "Zohrab, or the Hostage" (1832), "Ayesha, the Maid of Kars" (1834), and "The Mirza" (1841), all illustrations of Persian life.—His brother DAVID was also in diplomatic employment, and was minister to Switzerland (1832-'47). In his treatise, "What has Religion to do with Politics?" (London, 1848; German, Basel, 1851), he endeavored to prove that true statesmanship must be essentially based upon religion.

MORILLO, PABLO, count of Carthagena and marquis de la Puerta, a Spanish general, born in Fuente in 1777, died in Madrid in 1838. He first served in the navy and afterward in the army against Napoleon, and rose to the rank of general. In 1815 he was placed at the head of the Spanish forces in South America, where he became noted for his cruel treatment of the revolted colonists. He was eventually defeated by Bolivar and compelled to sign the truce of Truxillo (Nov. 25, 1820), after which he returned to Spain. In his subsequent course he alternately sided with the absolutist and constitutional parties without enjoying the confidence of either. In 1823 he took for a brief period the part of the royalists against the cortes of Seville, but afterward submitted to the regency and surrendered Galicia to the French. After the restoration of absolute monarchy he was expelled from the country and his estates were confiscated. In 1832 he was permitted to return and appointed governor of Galicia. For some time previous to his death he acted as commander of the forces against Don Carlos. He published his *Mémoires* in Paris in 1826.

MORIN, ARTHUR JULES, a French engineer, born in Paris, Oct. 19, 1795. He was educated at the polytechnic school of Paris and at the military academy of Metz, where he officiated for some time as professor of mechanics. Subsequently he became professor of practical mechanics in the *conservatoire des arts et métiers* in Paris, and has now (1860) for some years been at the head of that institution. He holds the rank of general in the army, and is a member of the academy of sciences and of the board of artillery. In 1855 he acted as presi-

dent of the imperial commission of the great French exposition. He has published many works on mechanical subjects.

MORIN, FRÉDÉRIC, a French author, born in Lyons, June 11, 1828. He officiated for several years as professor of philosophy at Mâcon and Nancy, from whence he was dismissed after the *coup d'état* of Dec. 1851, and appointed to an inferior position at the lyceum of Bourges, but resigned it because he would not swear allegiance to the imperial government, and has since resided in Paris. In 1857 he was defeated as the opposition candidate for the department of Rhone in the legislative assembly. He belongs to that party of Roman Catholic politicians who advocate a liberal alliance with all other religious denominations for the defence of the principles of the first French revolution. He is the author of *Saint François d'Assise et les Franciscains* (1858); *De la Genèse et des principes métaphysiques de la science moderne* (1856); and *Dictionnaire de philosophie et de théologie scolastiques* (2 vols., 1857-'8), which last forms part of Abbé Migne's collection.

MORISCO (Sp., Moorish), a term applied to the Moors of Granada after their forcible conversion to Christianity in 1500.

MORLAKE, or MORLACHIANS (Slav. *Primorci*, adjoining the sea), a rude people of uncertain origin, inhabiting the mountainous coast land of Dalmatia, the Croatian Military Frontier, and the Hungarian Littoral, on the Adriatic. They speak a south-Slavic dialect, are mostly Roman Catholics, make skilful mariners, and form a large proportion of the sailors in the Austrian navy. The strait which separates the islands of Veglia, Arbe, and Pago from the same coast is generally called the strait of Morlaeca.

MORLAND, GEORGE, an English painter, born in London, June 26, 1768, died there in 1806. His father, an artist of moderate abilities, perceiving in him early symptoms of genius, employed it to his own advantage, and between the ages of 14 and 21 young Morland was engaged in making pictures and drawings for sale. When 21 he left his father's house and pursued his art alone, reaching the full maturity of his powers about 1790, after which period he gave himself up to intemperance and profligacy. During the last few years of his life he was seldom sober, and painted only to supply his actual necessities; and many of his later works were executed in sponging houses, in one of which he died. His subjects were generally selected from low life, and notwithstanding he had received no academical instruction and was ignorant of anatomy, he acquired an astonishing skill in painting domestic animals, the pig being his favorite. He was also very successful in delineating the more common species of English landscape, consisting of fields and hedges with ponds of water and clay banks. His execution deteriorated greatly toward the close of his life, but his pictures were nevertheless in such demand that a regular manufactory of imitations of them was established by his brother Henry.

At the present day well authenticated pictures by Morland bring large prices.

MORMONS, or LATTER DAY SAINTS, the followers of a religion founded by Joseph Smith, who was born at Sharon, Windsor co., Vt., Dec. 28, 1805, and killed at Carthage, Ill., June 27, 1844. At the age of 10 years he removed with his parents to Palmyra, Wayne co., N. Y. From the testimony of their neighbors in Palmyra, the reputation of the Smiths was bad. They avoided honest labor, and occupied themselves chiefly in digging for hidden treasures and in similar visionary pursuits. They were intemperate and untruthful, and were commonly suspected of sheep stealing and other offences. Upward of 60 of the most respectable citizens of Wayne co. testified in 1838, under oath, that the Smith family were of immoral, false, and fraudulent character, and that Joseph was the worst of them. These statements are not, in general, contradicted by the Mormons. His most distinguished disciple, Brigham Young, says: "The doctrine he teaches is all I know about the matter; bring any thing against that if you can. As to any thing else, I do not care if he acts like a devil; he has brought forth a doctrine that will save us, if we will abide by it. He may get drunk every day of his life, sleep with his neighbor's wife every night, run horses and gamble; I do not care any thing about that, for I never embrace any man in my faith." The Mormon writers state that Smith was very poorly educated. He could read with difficulty, wrote an imperfect hand, and had a very limited understanding of the elementary rules of arithmetic. The revelations, proclamations, letters, and other documents put forth by him in the subsequent part of his career, were generally written by others. According to his own account, Smith at about the age of 15 years began to have visions. On the night of Sept. 21, 1823, the angel Moroni appeared to him three times, giving him much instruction, and informing him that God had a work for him to do; and that a record written upon gold plates, and giving an account of the ancient inhabitants of America and the dealings of God with them, was deposited in a particular place in the earth (a hill in Manchester, Ontario co., N. Y.), and, with the record, two transparent stones in silver bows like spectacles, which were anciently called the Urim and Thummim, on looking through which the golden plates would become intelligible. On Sept. 22, 1827, the angel of the Lord placed in Smith's hands the plates and the Urim and Thummim. The plates were nearly 8 inches long by 7 wide, and a little thinner than ordinary tin, and were bound together by 3 rings running through the whole. Altogether they were about 6 inches thick, and were neatly engraved on each side with hieroglyphics in a language called the reformed Egyptian, not then known on the earth. From these plates Smith, sitting behind a blanket hung across the room to keep the sacred rec-

ords from profane eyes, read off, with the aid of the stone spectacles, the "Book of Mormon," or Golden Bible as he sometimes called it, to Oliver Cowdery, who wrote it down as Smith read it. It was printed in 1830, in a volume of several hundred pages. Appended to it was a statement signed by Oliver Cowdery, David Whitmer, and Martin Harris, who had become professed believers in Smith's supernatural pretensions, and are called by the Mormons "the three witnesses." They said: "We declare with words of soberness that an angel of God came down from heaven, and he brought and laid before our eyes that we beheld and saw the plates and the engravings thereon." Several years afterward, however, all three of these witnesses quarrelled with Smith, renounced Mormonism, and avowed the falsity of their testimony. In a Mormon publication, "Elder's Journal" (1837), Smith himself wrote thus of Harris: "There are negroes who have white skins as well as black ones; Granny Parish and others, who acted as lackeys, such as Martin Harris. But they are so far beneath my contempt, that to notice any of them would be too great a sacrifice for a gentleman to make." Immediately on the appearance of the "Book of Mormon" many of Smith's neighbors testified that he had repeatedly made contradictory statements about the plates and the Golden Bible. Peter Ingersoll, one of his intimate friends, declared under oath: "Smith told me the whole affair was a hoax, that he had no such book, and did not believe that there was such a book in existence; but, said he, as I have got the damned fools fixed, I shall carry out the fun." The "Book of Mormon" is a collection of 16 distinct books professing to be written at different periods by successive prophets. Its style is an exceedingly clumsy and verbose imitation of that of the common English translation of the Bible, portions of which, to the number in all of 800 passages, are incorporated without acknowledgment, and are frequently cited by Mormons as specimens of the book. A multitude of names are introduced, some Hebrew and biblical, others Greek and Latin, and the rest imitations of the former. The first book professes to be the work of Nephi, a Jew, the son of Lehi, who dwelt at Jerusalem in the days of King Zedekiah, about 600 B. C. In obedience to the command of the Lord, who appeared to him in a dream, he went into the wilderness of Arabia and dwelt there a long time with his family. At length, still under divine instruction, Lehi and his family set out in search of a promised land, and after travelling "nearly eastward" for 8 years, "through a wilderness," they reached the ocean. Here they built a ship, and, guided by a compass, sailed to America. The Book of Mormon itself gives no indication of the part of the continent on which they landed, but later Mormon interpretations or revelations declare it to have been the coast of Chili. Those who arrived in America were Lehi and his wife, his 4 sons,

Laman, Lemuel, Sam, and Nephi, and their 4 wives, 2 "sons of Ishmael" and their 2 wives, and Zoram, a servant, and his wife; in all, 8 adult men with as many wives. Beside these, there were 2 infant sons of Lehi born during the journey through the wilderness, Jacob and Joseph. In America they found "beasts in the forest of every kind, both the cow, and the ox, and the ass, and the horse, and the goat." Soon after his arrival in America Lehi died, and dissensions speedily ensued between Nephi and his elder brothers Laman and Lemuel; and, separating from them, Nephi moved into the wilderness accompanied by Sam and Zoram and their families, the boys Jacob and Joseph, and such of the women and children as took his side. Laman and Lemuel and the "sons of Ishmael" and their families, as a punishment for rebelling against Nephi, whom the Lord had appointed to be their ruler, were cursed by the Lord, and they and all their posterity condemned to have dark skins and to "become an idle people, full of mischief and subtlety, which did seek in the wilderness for beasts of prey." This was the origin of the American Indians, who are consequently believed by the Mormons to be of Jewish race. Nephi and his 4 companions multiplied and prospered in their new settlement to such a degree that within 80 years after their departure from Jerusalem, that is, within 22 years after their arrival in America, they had become so numerous and rich that Nephi says: "And I did teach my people to build buildings; and to work in all manner of wood, and of iron, and of copper, and of brass, and of steel, and of gold, and of silver, and of precious ores, which were in great abundance. And I, Nephi, did build a temple; and I did construct it after the manner of the temple of Solomon, save it were not built of so many precious things; for they were not to be found upon the land; wherefore it could not be built like unto Solomon's temple. But the manner of the construction was like unto the temple of Solomon; and the workmanship thereof was exceeding fine. . . . And it came to pass that I, Nephi, did consecrate Jacob and Joseph, that they should be priests and teachers over the land of my people. And it came to pass that we lived after the manner of happiness. And thirty years had passed away from the time we left Jerusalem." Nephi died about 50 years after his arrival in America, and his people continued to be called Nephites and to be governed by kings bearing the name of Nephi for many generations. The record of their history was continued on golden plates by Jacob the brother of Nephi, Enos the son of Jacob, Jarom the son of Enos, Omni the son of Jarom, and finally by Mormon, whose name is given to a single book, as well as to the whole volume, and who, "many hundred years after the coming of Christ," transmitted to his son Moroni the plates containing the writings of the authors already mentioned, together with those of Mosiah,

Zeniff, Alma, Helaman, Nephi the Second, and Nephi the Third. These books consist almost wholly of a narrative of transactions in North and South America, chiefly of wars between the Nephites and the Lamanites or red men, and of revolutions in the land of Zarahemla, which was near the isthmus of Darien, where there was an exceeding great city. At length, in the days of Nephi the Second, a terrible earthquake announced the crucifixion of Christ at Jerusalem, and 8 days afterward the Lord himself descended out of heaven into the chief city of the Nephites, in sight of all the people, to whom he exhibited his wounded side and the prints of the nails in his hands and feet. He remained among them 40 days, instructing them in Christianity and instituting Christian churches. The Christians of America, unlike their brethren in the old world, immediately adopted the Christian era for their chronological computations; and according to the record, in the 4 following centuries the wars between them and the heathen Lamanites continued to rage, with great destruction of the Christians, whose populous and civilized cities, which were very numerous throughout North America, were gradually captured and destroyed. In the year 884 the Christians made their final stand on the hill Cumorah, in western New York, where in a great battle 230,000 of them were slain. Moroni, one of the survivors, after wandering a fugitive till A. D. 420, sealed up the golden plates on which all these things were written, and hid them in the hill where they were found by Joseph Smith. One of the books in the collection, the book of Ether, gives an account of an earlier settlement of America than that of Lehi, by a colony from the tower of Babel, soon after the deluge, which was led by Jared, and in time became a great nation which was destroyed for its sins before the arrival of the colony from Jerusalem. The book of Alma, which professes to have been written several centuries before Christ, contains the following passage: "For do we not read, that God is the same yesterday, to-day, and for ever, and that in him is neither variableness nor shadow of changing?" These expressions, which the author of Alma cites as written and read in his day, were also written in Greek by Paul and James in their epistles in the first century after Christ. At a still earlier period Nephi, anticipating Shakespeare, speaks of "the cold and silent grave whence no traveller returns."—The religious teachings of the "Book of Mormon" relate in great part to doctrinal questions that were rife in the villages of western New York about 1830. Calvinism, Universalism, Methodism, Millenarianism, Roman Catholicism, and other modern forms of belief, are discussed. Infant baptism is warmly condemned, and polygamy is repeatedly denounced; as for example: "For behold, thus saith the Lord, this people begin to wax in iniquity; they understand not the Scriptures; for they seek to excuse themselves in committing whoredoms, because of the things which were written con-

cerning David and Solomon his son. Behold, David and Solomon truly had many wives and concubines, which thing was abominable before me, saith the Lord. Wherefore, thus saith the Lord, I have led this people forth out of the land of Jerusalem, by the power of mine arm, that I might raise up unto me a righteous branch from the fruit of the loins of Joseph. Wherefore I, the Lord God, will not suffer that this people shall do like unto them of old. Wherefore, my brethren, hear me and hearken to the word of the Lord; for there shall not any man among you have save it be one wife; and concubines he shall have none; for I, the Lord, delighteth in the chastity of women." Free masonry, which about 1880 was a popular subject of discussion in western New York, figures extensively in the "Book of Mormon," which abounds in anti-masonic denunciations of secret societies, though Smith and all the leading Mormons subsequently became free masons, and organized their ecclesiastical hierarchy in imitation of the masonic system of degrees.—According to the opponents of Mormonism, from investigations made soon after the appearance of the "Book of Mormon," the fact is fully established that the real author of the work was Solomon Spalding, who was born in Ashford, Conn., in 1761, was graduated at Dartmouth college, and was afterward ordained. After preaching for 3 or 4 years, he relinquished the ministry, and engaged in mercantile business at Cherry Valley, N. Y., whence in 1809 he removed to Conneaut, Ohio. From Conneaut in 1812 he removed to Pittsburgh, and thence in 1814 to Amity, Penn., where he died in 1816. He had an inveterate taste for literary pursuits, and wrote several novels, which he was in the habit of reading to his friends in manuscript, as they were so worthless that he could find no publisher for them, while his poverty prevented him from issuing them at his own expense. During his residence in Ohio in 1810-'11-'12 he wrote a romance to account for the peopling of America by deriving the Indians from the Hebrews, in accordance with an absurd notion then prevalent in some parts of the country that the American Indians were descended from the lost tribes of Israel. As early as 1813 this work was announced in the newspapers as forthcoming, and as containing a translation of the "Book of Mormon." Spalding entitled his book "Manuscript Found," and intended to publish with it by way of preface or advertisement a fictitious account of its discovery in a cave in Ohio. His widow, in a statement published by her in the "Boston Journal," May 18, 1839, declares that in 1812 he placed his manuscript in a printing office at Pittsburg, with which Sidney Rigdon was connected. Rigdon, she says, copied the manuscript; and his possession of a copy was known to all in the printing office, and was often mentioned by himself. Subsequently the original manuscript was returned to the author, who soon after died. His widow preserved it till

after the publication of the "Book of Mormon," when she sent it to Conneaut, where a public meeting, composed in part of persons who remembered Spalding's work, had requested her to send the manuscript that it might be publicly compared with the "Book of Mormon." She says in conclusion: "I am sure that nothing would grieve my husband more, were he living, than the use which has been made of his work. The air of antiquity which was thrown about the composition doubtless suggested the idea of converting it to the purposes of delusion. Thus, a historical romance, with the addition of a few pious expressions, and extracts from the Sacred Scriptures, has been construed into a new Bible, and palmed off upon a company of poor deluded fanatics as divine." Sidney Rigdon was born in St. Clair township, Alleghany co., Penn., Feb. 19, 1798. Soon after getting possession of a copy of Spalding's manuscript, he quitted the printing office and became a preacher of doctrines peculiar to himself, and very similar to those afterward incorporated into the "Book of Mormon." He had a small body of converts to his notions when about 1829 he became associated with Joseph Smith, who was then endeavoring to gain believers to his tale of the golden plates and stone spectacles. It is asserted that through Rigdon's agency Smith became possessed of a copy of Spalding's manuscript, which he read from behind the blanket to his amanuensis Oliver Cowdery, with such additions as suited the views and purposes of Rigdon and himself. Immediately on its publication, the "Book of Mormon" was claimed not only by Spalding's widow but by many of his friends as his long lost work. John Spalding, a brother of Solomon, says in a deposition: "I made him (Solomon Spalding) a visit in about 3 years after (1813), and found that he had failed, and was considerably involved in debt. He then told me he had been writing a book, which he intended to have printed, the avails of which he thought would enable him to pay all his debts. The book was entitled 'Manuscript Found,' of which he read to me many passages. It was a historical romance of the first settlers of America, endeavoring to show that the American Indians are the descendants of the Jews or the lost tribes. It gave a detailed account of their journey from Jerusalem, by land and sea, till they arrived in America under the command of Nephi and Lehi. They afterward had quarrels and contentions, and separated into two distinct nations, one of which he denominated Nephites and the other Lamanites. Cruel and bloody wars ensued, in which great multitudes were slain. They buried their dead in large heaps, which caused the mounds so common in this country. Their arts, sciences, and civilization were brought into view, in order to account for all the curious antiquities found in various parts of North and South America. I have recently read the 'Book of Mormon,' and to my great surprise I find nearly the same historical matter,

names, &c., as they were in my brother's writings. I well remember that he wrote in the old style, and commenced about every sentence with 'And it came to pass,' or 'Now it came to pass,' the same as in the 'Book of Mormon;' and according to the best of my recollection and belief, it is the same as my brother Solomon wrote, with the exception of the religious matter. By what means it has fallen into the hands of Joseph Smith, jr., I am unable to determine." Martha Spalding, the wife of John Spalding, Henry Lake, the partner in business of Solomon Spalding, and many others corroborated these statements in the fullest manner. John N. Miller of Springfield, Penn., testified in Sept. 1833, that in 1811 he was in the employ of Spalding, and lodged and boarded in his house, and frequently perused portions of the "Manuscript Found," which the author also sometimes read to him. Miller says: "I have recently examined the 'Book of Mormon,' and find in it the writings of Solomon Spalding, from beginning to end, but mixed up with Scripture and other religious matter, which I did not meet in the 'Manuscript Found.' Many of the passages in the Mormon book are *cerbasim* from Spalding, and others in part. The names of Nephi, Lehi, Moroni, and in fact all the principal names are brought fresh to my recollection by the gold Bible." The printing of the "Book of Mormon" was done at the expense of Martin Harris, who had some property, and was persuaded that he could make money by the speculation. While the work was in progress, this man called upon Prof. Anthon of New York with a transcript on paper which Smith had given him of the characters on one of the golden plates. "This paper," Prof. Anthon states in a letter dated New York, Feb. 17, 1834, "was in fact a singular scroll. It consisted of all kinds of crooked characters, disposed in columns, and had evidently been prepared by some person who had before him at the time a book containing various alphabets, Greek and Hebrew letters, crosses and flourishes; Roman letters, inverted or placed sideways, were arranged and placed in perpendicular columns; and the whole ended in a rude delineation of a circle, divided into various compartments, decked with various strange marks, and evidently copied after the Mexican calendar given by Humboldt, but copied in such a way as not to betray the source whence it was derived." This letter was written to contradict a report set afloat by Smith that Prof. Anthon had pronounced the characters to be Egyptian hieroglyphics.—Smith and Rigdon seem at first to have had vague and confused ideas as to the nature and design of the church they were about to establish. They were both inclined to teach millenarianism, which at that time was beginning to attract attention in western New York; and they accordingly settled into the doctrine that the millennium was close at hand, that the Indians were to be speedily converted, and that America was to be

the final gathering place of the saints, who were to assemble at New Zion or New Jerusalem, somewhere in the interior of the continent. With the "Book of Mormon" as their text and authority, they began to preach this new gospel; and Smith's family and a few of his associates, together with some of Rigdon's previous followers, were soon numerous enough to constitute the Mormon church, as it was styled by the people around them, or the church of Latter Day Saints, as they presently began to call themselves. The church was first regularly organized at Manchester, N. Y., April 6, 1830, and the first conference was held at Fayette, N. Y., in June, at which time the number of believers had increased to 80. Smith, directed as he said by revelation, in Jan. 1831, led the whole body of believers to Kirtland, Ohio, which was to be the seat of the New Jerusalem. Here converts were rapidly made, and soon, desiring a wider field for the growth of the church, Smith and Rigdon travelled westward, looking for a suitable location, which was found in Independence, Jackson co., Mo., where in August Smith dedicated a site for the temple to be erected by the saints, and named the place New Jerusalem. On their return to Kirtland, where they proposed to remain for 5 years "and make money," Smith and Rigdon established a mill and a store, and set up a bank without a charter, of which Smith appointed himself president, and made Rigdon cashier. The neighboring country was flooded with notes of very doubtful value; and in consequence of this and other business transactions in which Smith and Rigdon were accused of fraudulent dealing, a mob on the night of March 22, 1832, dragged the two prophets from their beds, and tarred and feathered them. About a year afterward a government for the church was instituted, consisting of 8 presidents, Smith, Rigdon, and Frederic G. Williams, who together were styled the first presidency, a revelation from the Lord having declared that the sins of Rigdon and Williams were forgiven, "and that they were henceforth to be accounted as equal with Joseph Smith, jr., in holding the keys of his last kingdom." About this time Brigham Young became a convert to Mormonism. He was born at Whitingham, Vt., June 1, 1801, and was the son of a farmer who had been a soldier of the revolution. He arrived at Kirtland toward the close of 1832, and was soon ordained an elder, and began to preach. His talent and shrewdness speedily made him prominent, and in Feb. 1835, when a further step was taken in the organization of a hierarchy by the institution of the quorum of the 12 apostles, he was ordained one of the 12, and sent out with the other apostles to preach the new doctrines. His field of labor was the eastern states, and he was signally successful in making converts. In 1836 a large and costly temple, which had been for 8 years in process of building, was consecrated at Kirtland; and in 1837 Orson Hyde and Heber C. Kimball, the latter of whom had become a convert in

1832, were sent as missionaries to England. In Jan. 1838, the bank at Kirtland having failed, Smith and Rigdon, to avoid arrest for fraud, fled in the night, hotly pursued by their creditors, and took refuge in Missouri. In that state, meanwhile, large numbers of Mormons had collected, and had become involved in quarrels with the people, by whom they were charged with plundering and burning habitations, and with secret assassinations; and after various conflicts with mobs, who drove them successively from Jackson co. and from Clay co., they settled in Caldwell co., at the town of Far West, where Smith and Rigdon joined them. The conflicts with the Missourians still continued, and many outrages were committed and several persons killed on both sides. In the midst of their external troubles, internal dissensions broke out among the Mormons. Several of their leading men apostatized and accused Smith of gross crimes and frauds. On Oct. 24, 1838, Thomas B. March, the president of the 12 apostles, and Orson Hyde, also one of the apostles, made before a justice of the peace in Ray co., Mo., an affidavit in which March said, corroborated by Hyde: "They have among them a company, consisting of all that are considered true Mormons, called the Danites, who have taken an oath to support the heads of the church in all things that they say or do, whether right or wrong. . . . The plan of said Smith, the prophet, is to take this state; and he professes to his people to intend taking the United States, and ultimately the whole world. This is the belief of the church, and my own opinion of the prophet's plan and intentions. The prophet inculcates the notion, and it is believed by every true Mormon, that Smith's prophecies are superior to the law of the land. I have heard the prophet say that he would yet tread down his enemies and walk over their dead bodies; that if he was not let alone he would be a second Mahomet to this generation, and that he would make it one gore of blood from the Rocky mountains to the Atlantic ocean." The defiant and menacing tone of the Mormon leaders contributed much to the excitement against them. Rigdon, in a sermon preached at Far West, July 4, 1838, said: "We take God and all the holy angels to witness this day, that we warn all men in the name of Jesus Christ to come on us no more for ever. The man, or the set of men, who attempts it, does it at the expense of their lives. And that mob that comes on us to disturb us, it shall be between them and us a war of extermination, for we will follow them till the last drop of their blood is spilled, or else they will have to exterminate us. For we will carry the seat of war to their own houses, and their own families, and one party or the other shall be utterly destroyed." Toward the close of 1838 the conflict between the Mormons and the Missourians assumed the character and proportions of civil war. The Mormons armed themselves, and assembling in large bodies fortified their towns and defied the officers of the

law. The militia of the state was called out by the governor, and Rigdon and Smith were arrested, charged with treason, murder, and felony. The forces of the state being overwhelming in number, the Mormons capitulated and agreed to quit Missouri, and to the number of several thousands crossed the Mississippi into Illinois. They were soon after joined by Smith, who broke out of the gaol where he had been confined awaiting trial. Rigdon had previously been liberated by a writ of habeas corpus. The following extract from the message of the governor of Missouri in 1840 states the character of the transactions which resulted in the expulsion of the Mormons: "These people had violated the laws of the land by open and avowed resistance to them; they had undertaken, without the aid of the civil authority, to redress their real or fancied grievances; they had instituted among themselves a government of their own, independent of and in opposition to the government of this state; they had, at an inclement season of the year, driven the inhabitants of an entire county from their homes, ravaged their crops, and destroyed their dwellings. Under these circumstances it became the imperious duty of the executive to interpose and exercise the powers with which he was invested, to protect the lives and property of our citizens, to restore order and tranquillity to the country, and maintain the supremacy of our laws." The Mormons were kindly received in Illinois, and Dr. Isaac Galland, who owned a large tract of land at Commerce, Carthage co., Ill., gave Smith a considerable portion of it in order to enhance the value of the rest by the settlement of the Mormons there. Smith accordingly received a revelation commanding the saints to establish themselves at Commerce, and build a city to be called Nauvoo on the land presented to him, which he divided into house lots and sold to his followers at high prices. By this transaction, and by other equally successful speculations, the prophet in a few years amassed a fortune estimated at upward of \$1,000,000. Nauvoo soon grew to be a city of several thousand inhabitants, the saints being summoned by a new revelation to assemble there from all quarters of the world, and to build a temple for the Lord, and a hotel in which Smith and his family should "have place from generation to generation, for ever and ever." The legislature of Illinois granted a charter for the city of Nauvoo, conferring upon it extraordinary privileges, which enabled Smith, Rigdon, and the other leaders to exercise almost unlimited civil power. They were authorized by charter to organize a military body, which was accordingly formed under the name of the Nauvoo legion, and comprised nearly all the Mormons capable of bearing arms. Smith was commander of this force with the rank of lieutenant-general. Beside this office, he held those of mayor of the city and first president of the church. By a revelation given April 6, 1830, he had been appointed "seer, translator, prophet, apostle of

Jesus Christ, and elder of the church;" and the Lord had said of him: "The church shall give heed to all his words and commandments which he shall give unto you; for his word shall ye receive as if from my own mouth, in all patience and faith." This revelation gave the prophet absolute authority over his followers, making him the mouthpiece of God himself. The civil and military offices which he conferred upon himself at Nauvoo and the legion at his command gave him supreme power within the city, whose charter had been purposely so framed that the state authorities were almost excluded from jurisdiction within its limits. On April 6, 1841, the foundation of the temple was laid at Nauvoo, by Lieut. Gen. Smith, who appeared at the head of the legion, surrounded by a numerous military staff; and the saints being commanded by revelation not only to contribute to its erection, but to labor personally upon the work every tenth day, its walls rapidly arose.—In 1838 Smith had persuaded a number of women to cohabit with him, calling them his spiritual wives, although he had a lawful wife to whom he had been married in 1827. His wife became jealous of these rivals, and to pacify her Smith received, July 12, 1843, a revelation authorizing polygamy. This fact being whispered at Nauvoo, much scandal was created in consequence. The imputation was strenuously denied in public, and in 1845 the heads of the church deemed it prudent to put forth a formal denial of the charge in the following words: "Inasmuch as this church of Christ has been reproached with the crimes of fornication and polygamy, we declare that we believe that one man should have but one wife, and one woman but one husband; except in case of death, when either is at liberty to marry again." It was not till 1852 that they admitted the truth, and boldly avowed and defended polygamy on the authority of the revelation of 1843. Meantime Smith in 1843 and 1844 made advances to so many women in Nauvoo, soliciting them to become his spiritual wives, that great uproar was created by the declarations of those whose virtue was proof against his attempts. Among others who repelled and denounced him publicly was Mrs. Foster, wife of Dr. Foster. Her husband, together with William Law and others who had been similarly outraged, renounced Mormonism, and commenced at Nauvoo the publication of a newspaper, the "Expositor," to expose Smith. In the first number they printed the affidavits of 16 women to the effect that Joseph Smith, Sidney Rigdon, and others had endeavored to convert them to the spiritual wife doctrine, and to seduce them under the plea of having had special permission from heaven. This publication created great excitement, and on May 6, 1844, Smith and a party of his followers attacked the "Expositor" office and razed it to the ground, destroying the presses and other contents of the building. Foster and

Law fled and took refuge in Carthage, the county seat, where they obtained warrants against Joseph Smith, his brother Hyrum Smith, and 16 others. The warrant was served upon Smith, but he refused to obey, and the constable who served it was driven from Nauvoo. The county authorities called out the militia to enforce the law; the Mormons armed themselves, and a civil war seemed impending, when the governor of the state persuaded the two Smiths to surrender and take their trial. They were committed to the gaol at Carthage, and a guard stationed for their protection. On the evening of June 27 a mob, composed chiefly of Missourians, attacked the gaol, overpowered the guard, and fired upon the prisoners with rifles through a window and door. Hyrum Smith was instantly shot dead. Joseph returned the fire with a revolver till his charges were exhausted, and then attempted to escape through the window, but was shot as he leaped through it and fell to the ground dead. The death of the prophet caused much temporary confusion among the saints. Sidney Rigdon aspired to succeed him as head of the church; but Brigham Young was chosen first president, and Rigdon, being contumacious, was cut off from the communion of the faithful, cursed, and solemnly delivered to the devil "to be buffeted in the flesh for a thousand years." In 1845 the charter of Nauvoo was repealed by the legislature of Illinois, and the Mormons made preparations to remove to the Rocky mountains. Early in the following year they gathered in considerable numbers at Council Bluffs in Iowa. Those who remained in Nauvoo became again involved in trouble with the surrounding people, and in Sept. 1845, the city was cannonaded for 8 days and its inhabitants driven out at the point of the bayonet. In the following year pioneers crossed the plains from Council Bluffs to Salt Lake valley, Utah, where Brigham Young arrived July 24, 1847. In May, 1848, the main body of the saints set out for Utah, and arrived at the Great Salt lake in the autumn. Salt Lake City was founded (see SALT LAKE CITY), and large tracts of land brought under cultivation. An "emigration fund" was established, and large numbers of converts brought by a well organized system from Europe, chiefly from the working classes of Great Britain, and especially from Wales. A considerable number came also from Sweden and Norway, and a smaller number from Germany, Switzerland, and France. In March, 1849, a convention was held at Salt Lake City and a state organized under the name of Deseret, a word understood by the Mormons to signify "the land of the honey bee." A legislature was elected and a constitution framed and sent to Washington; but congress refused to recognize the new state, and in September organized the country occupied by the Mormons into the territory of Utah, of which Brigham Young was appointed governor by President Fillmore. In the following year the federal judges of the territory were forced by threats

of violence from Brigham Young to quit Utah, and the laws of the United States were openly defied and subverted. This led to the removal of Brigham Young, and the appointment of Col. Steptoe of the U. S. army as governor. Col. Steptoe arrived in Utah in Aug. 1854, with a battalion of soldiers; but such was the state of affairs in the territory that he did not deem it prudent to assume the office of governor, and after wintering in Salt Lake City he formally resigned his post and removed with his troops to California. In a sermon preached in the tabernacle at Salt Lake City on the Sunday after Col. Steptoe's departure, Brigham Young said: "I am, and will be governor, and no power can hinder it, until the Lord Almighty says: 'Brigham, you need not be governor any longer.'" Most of the civil officers who were commissioned about the same time with Col. Steptoe arrived in Utah a few months after he had departed. They were harassed and terrified like their predecessors. In Feb. 1856, a mob of armed Mormons, instigated by sermons from the heads of the church, broke into the court room of the U. S. district judge, and at the point of the bowie knife compelled Judge Drummond to adjourn his court *sine die*. Soon afterward all the U. S. officers, with the exception of the Indian agent, were forced to flee from the territory. These and similar outrages at length determined President Buchanan to supersede Brigham Young in the office of governor, and to send to Utah a military force to protect the federal officers and to compel obedience to the laws. The Mormons on their part attempted to justify their treatment of the U. S. officials, by alleging that some of them were profligate and disreputable persons, an accusation which they attempted to sustain by scandalous statements which were probably not entirely destitute of truth. In 1857 the office of governor of Utah was conferred upon Alfred Cumming, a superintendent of Indian affairs on the upper Missouri, and that of chief justice on Judge Eekels of Indiana; and a force of 2,500 men under experienced officers was sent to protect them in the discharge of their proper functions. The Mormons were greatly excited at the approach of these troops. Young in his capacity of governor issued a proclamation denouncing the army as a mob, and forbidding it to enter the territory, and calling the people of Utah to arms to repel its advance. The army reached Utah in September, and on Oct. 5 and 6 a party of mounted Mormons attacked and destroyed several of the supply trains, and a few days later cut off 800 oxen from the rear of the army and drove them to Salt Lake City. The army, of which Col. Johnston had by this time assumed the command, was overtaken by the snows of winter before it could reach Salt Lake valley, and about the middle of November went into winter quarters on Black's Fork near Fort Bridger. On Nov. 27 Gov. Cumming issued a proclamation declaring the territory to be in a state of rebel-

lion. In the spring of 1858, however, by the intervention of Mr. Thomas L. Kane of Pennsylvania, who had gone to Utah by way of California, bearing letters from President Buchanan, a good understanding was brought about between Gov. Cumming and the Mormon leaders; and toward the end of May two commissioners, Gov. Powell of Kentucky and Major McCulloch of Texas, arrived at the camp with a proclamation from the president, offering pardon to all Mormons who would submit themselves to the federal authority. This offer of pardon was accepted by the heads of the church, and shortly afterward the troops entered Salt Lake valley, and were stationed at Camp Floyd on the western side of Lake Utah, about 40 m. from Salt Lake City, where they remained till May, 1860, when they were withdrawn from the territory.—The number of Mormons in Utah is computed by their own authorities at 80,000 or 100,000, but it is maintained by other residents of the territory that this is an exaggeration, and that the real number is about 50,000. The number in other parts of the United States is very small. In New York and its neighborhood there are about 200. The number in the old world is estimated at 100,000, chiefly in Europe, though some are found in Asia, Africa, Australia, and Polynesia.—The priesthood of the Mormon church is organized into the following quorums: the first presidency, the twelve apostles, the high council, the seventies, high priests, elders, priests, teachers, and deacons. The first presidency (in 1860) consists of Brigham Young, Heber C. Kimball, and Daniel C. Wells. They preside over and direct the affairs of the whole church. The twelve apostles constitute a travelling presiding high council. The whole hierarchy is divided into two bodies, the Melchisedek priesthood and the Aaronic priesthood. To the former, which is the highest, belong the offices of apostle, seventy, patriarch, high priest, and elder. The Aaronic priesthood includes the offices of bishop, priest, teacher, and deacon, and can be held only by "literal descendants of Aaron," who are designated as such by revelation. The Mormon church teaches that there are many gods, and that eminent saints become gods in heaven, and rise one above another in power and glory to infinity. Joseph Smith is now the god of this generation. His superior god is Jesus, whose superior god and father is Adam. Above Adam is Jehovah, and above Jehovah is Elohim. All of these gods have many wives, and they all rule over their own descendants, who are constantly increasing in number and dominion. The glory of a saint when he becomes a god depends in some degree on the number of his wives and children, and therefore polygamy is inculcated and wives are "sealed" to saints here on earth to augment their power in the heavens. The gods are in the form of men, and they are the fathers of the souls of men in this world. The ten commandments are considered the rule of life together

with a revelation given to Joseph Smith, Feb. 27, 1833, which is called "A Word of Wisdom." It teaches that it is not good to drink wine or strong drinks, excepting in the sacrament of the Lord's supper, and then it should be home-made grape wine; that it is not good to drink hot drinks, or chew or smoke tobacco; that strong drinks are for the washing of the body, and that tobacco is an herb for bruises and sick cattle; that herbs and fruits are for the food of man; that grain is for the food of man and beasts and fowls; and that flesh is not to be eaten by man excepting in times of winter, cold, and famine. This "Word of Wisdom," however, is not regarded precisely as a commandment, but as a revelation to show forth the will of God, and "suited to the condition of all saints, young and old, male and female, without distinction." Infant baptism is condemned, but the children of the saints are considered old enough at 8 years to be baptized. Baptism for the dead is practised, a living person being publicly baptized as the representative of one or more deceased persons. Washington, Franklin, and other famous men have thus been vicariously baptized into the church. There have been many dispensations of religious truth, beginning with Adam and ending with the greatest of all, that through Joseph Smith, which is to culminate in the building of the New Jerusalem in Jackson co., Mo., and the gathering together of all the saints on the continent of America. A portion of the Mormons reject polygamy, and do not approve of the political schemes of Brigham Young and the leaders of the church in Utah. Joseph Smith, the son of the prophet, is regarded by them as the true living head of the church, and under his direction they have recently established themselves at Nauvoo. Their number is inconsiderable. (For the political and social condition of the Mormons in Utah, see *UTAH*.)—See "The Mormons," by Charles Mackay (London, 1851); "The Mormons or Latter Day Saints in the Valley of the Great Salt Lake," by Lieut. J. W. Gunnison (Philadelphia, 1852); "Utah and the Mormons," by Benjamin G. Ferris (New York, 1856); "The Book of Doctrines and Covenants selected from the Revelations of God by Joseph Smith" (Liverpool, 1854); "A compendium of the Faith and Doctrines of the Church of Jesus Christ of Latter Day Saints," by Franklin D. Richards, one of the twelve apostles (Liverpool, 1857); "Mormonism, its Leaders and Designs," by John Hyde, jr., formerly a Mormon elder (New York, 1857).

MORNAY, PHILIPPE DE, seigneur du Plessis-Marly, frequently known under the name of Duplessis-Mornay, a French soldier, statesman, and theologian, born at Bahy, Isle de France, in 1549, died in 1628. His father was a Roman Catholic, but his mother secretly brought him up as a Protestant, and after his father's death in 1560 he openly professed that religion. At an early age he travelled extensively in continental Europe. Subsequently he attached himself to

Admiral Coligni, and drew up a memorial in behalf of the Huguenots, which was presented to Charles IX., and Catharine de' Medici. After the massacre of St. Bartholomew's day, from which he had a narrow escape, he took refuge in England. In 1575 he was recalled by Henry of Navarre, afterward Henry IV., who intrusted to him the administration of the finances and some important missions to Queen Elizabeth. Being appointed general superintendent of Navarre, he stood almost alone the brunt of the religious civil war. On the alliance of his master with Henry III., he was placed in command of the town of Saumur, assigned as a place of safety to the Protestants. In 1589 he kidnapped and kept prisoner the old cardinal of Bourbon, whom the leaguers had proclaimed king in opposition to his nephew Henry IV., the lawful heir to the crown. In 1592 he entered into a negotiation with Mayenne, who was willing to submit to the king. He opposed the abjuration of Henry IV., and evinced so intemperate a zeal for Calvinism as to incur the king's displeasure. Nevertheless he kept his governorship of Saumur, where, on the death of Henry IV., he proclaimed the authority of Maria de' Medici; but he quarrelled with that princess, and in 1620 was compelled to resign his office, receiving as indemnity a sum of 100,000 livres. His high character, virtue, and knowledge made him for nearly half a century the chief of the French Calvinists; and he was commonly styled by the Catholics *le pape des Huguenots*. He left various controversial works, and also his personal *Mémoires*, which were published in 1624, '25, '51, and '52, in 4 vols. 4to., and more completely by Anguis (12 vols. 8vo., 1822-'5).

MORNY, CHARLES AUGUSTE LOUIS JOSEPH DE, count, a minister and reputed half brother of Napoleon III., born in Paris, Oct. 23, 1811. He is regarded as the son of Queen Hortense and of the count de Flahaut. He assumed the name of the count de Morny, a French nobleman resident at the Isle de France (Mauritius), who is said to have received 800,000 francs for adopting him as a son. He was educated under the care of his supposed grandmother, the accomplished Mme. de Flahaut, also known as Mme. de Souza from her second marriage with a Portuguese nobleman of that name, and placed in the institution Muron, where Edgar Ney was among his classmates. His proficiency in study was remarkable, and he was early introduced into society, where he was much noticed on account of his elegant and winning manners. It is related that on one occasion when he came to visit Talleyrand, with whom he was a favorite, that diplomatist said to a high personage who came immediately after young Morny had withdrawn: "Did you meet a little fellow holding the hand of M. de Flahaut?" "Yes, prince, on the staircase," was the reply. "Well," said Talleyrand, "remark what I say: that child will one day be minister." He attended one of the principal military academies of Paris during two years, and left it in 1832 with the

rank of sub-lieutenant, after which he was stationed for some time at Fontainebleau, where he is said to have turned his attention to the study of metaphysics and theology, although he does not seem to have long continued to cultivate those branches of knowledge. He served for some time in Algeria, where he was wounded, and was decorated with the order of the legion of honor for having saved the life of Gen. Trézel. Queen Hortense, on her death in 1837, bequeathed to him an annuity of 40,000 francs, and almost from that period until the present time he has been noted for his commercial and financial speculations. He made his début in the world of industry as a manufacturer of beet root sugar (1838), and has since been connected more or less successfully with most of the great enterprises which have in turn tempted the cupidity or the adroitness of French speculators. Previous to the revolution of 1848 he was for nearly 8 years a member of the chamber of deputies, and in 1849 he was elected to the legislative assembly; but up to that time his influence in political life proceeded from his occasional ability in handling financial and industrial subjects, and chiefly from his reputation as a versatile, skilful, and frequently successful speculator. The advent of Louis Napoleon to the presidency brought him into the front rank of prominence. He became the most devoted and adroit tool of his half brother, and one of his most effective assistants in the consummation of the *coup d'état* of Dec. 2, 1851. After that event he held the office of minister of the interior until Jan. 23, 1852, when he relinquished it because Fould and other of his colleagues had withdrawn from the administration on account of the confiscation of the property of the Orleans family. Subsequently he became a member of the legislative body, and since 1854 he has officiated as its president. He attended the coronation of the emperor Alexander II. as the representative of the French government, and was treated in Russia not merely as the ambassador but as the private friend of the French emperor. In St. Petersburg as in Paris he ingratiated himself, by the amenity of his manners and the liveliness of his conversation, with almost every one who came within his sphere, and gained the hand of the young and wealthy princess Trubetskoi, who had been brought up at the institution of the imperial maids of honor, and whom the empress dowager wished to place among the ladies of the reigning empress; the latter, however, declined her services on account of her being too beautiful, but sent her as a wedding present her portrait set with diamonds. The marriage was celebrated Feb. 19, 1857, at St. Petersburg, according to Greek and Catholic rites; and the count is said to have presented his bride with diamonds to the value of 2,000,000 francs. He purchased also, in the name of his wife, a seigniorial estate of the Sevlosky family, about 12 miles from St. Petersburg. The present Sir Robert Peel, in one of his humorous speeches to his constituents,

describes Morny as "a spick and span man of considerable *aplomb*, and who, by the way, is one of the greatest speculators in the world."

MORO, ARRONI, also called Sir Anthony More, a Flemish painter, born in Utrecht about 1525, died in Antwerp in 1581. Early in life he gained considerable reputation as a portrait painter, and executed likenesses of the infanta, the future Philip II. king of Spain, and of various members of the royal family of Portugal. In 1554 he painted the portrait of Philip's second wife, Mary of England, during whose reign he occupied the position of court painter and was probably knighted. Several of his portraits of the queen and of the English nobility are in the palace at Hampton Court. Subsequently he was in the service of Philip II. and the duke of Alva, by the latter of whom he was appointed to the lucrative office of receiver general of the revenues of West Flanders. His portraits were greatly inferior to Holbein's, to whom some of his works in England are attributed; he occasionally attempted figure pieces.

MOROCCO, or MAROCCO (called by the natives *Moghrib-el-aksa*, "the extreme West," or briefly *Moghrib*), an empire in the N. W. of Africa, between lat. 28° and 36° N., and long. 1° 20' and 11° 30' W., bounded N. by the strait of Gibraltar and the Mediterranean, E. by Algeria, S. by the Sahara, and W. by the Atlantic ocean; area estimated at 222,560 sq. m.; pop. at 6,000,000 to 8,000,000. The empire is composed of the territories of Fez, Morocco, and Taflet. Fez and Morocco lie N. W. of the Atlas mountains, the former occupying the basin of the Mulweeyah and the country N. of about lat. 32°; and Taflet is on the opposite side of the mountain range. The whole empire is divided into 30 governments, each administered by a *kaid*. Morocco, however, is not territorially divided in the manner usual in other countries; but the division best known in it is derived from the tribes occupying certain districts, which are very unequal in extent, and continually varying, sometimes confined to a single town, and sometimes embracing an extensive territory. Beside Morocco, the capital, the chief towns are Tangier, Tetuan, El Araish or Larash, Salé and Rabatt, Mogadore or Suira, the port of the town of Morocco, Agadir, Fez, Teza, Mequinez, Tefsa, Demnet, Terodant, Tadsí, Taflet, Tatta, and the Spanish town of Ceuta, near the W. entrance of the strait of Gibraltar. The coast line is but little indented, and there are not many good harbors; Tangier and Mogadore are the best, the rest being mere open roadsteads at the mouths of rivers. On the Mediterranean, along which Morocco extends for 230 m., the coast is bold and rocky; the most remarkable promontories are those of Ceuta, opposite Gibraltar, and Cape Spartel, a little further W. This rocky coast continues beyond the strait as far as lat. 35°, where its character changes, and it becomes low, faced with sand hills. Further S. it becomes rocky again, and the S. boundary terminates in Cape

Nun. The Atlas mountains extend through Morocco from N. E. to S. W.; their S. portion is called the Greater, and the N. the Lesser Atlas. The chain is composed of several parallel ranges, and contains the most elevated points known in N. Africa; the highest is about 18,000 feet above the sea; and Miltin, a peak distant about 80 m. S. S. E. from the city of Morocco, is 11,500 feet high. Many of the peaks are covered with snow for the greater part of the year. Adjoining the central chain are several table lands of great extent, and at a little distance N. from it extends the maritime chain, called Er Rif, having a general height of from 2,500 to 3,500 feet. Little is known of the inferior chains which run parallel with the Atlas in the desert, in the S. E.; but they are not supposed to be of great extent. The Atlas mountains separate the rivers of Morocco which enter the Atlantic, from those which either fall into the Mediterranean or are lost in the sands of the Sahara. The rivers flowing from the N. side of the Atlas have the shorter course, but are perennial, while those running S. are dry in summer. The Malooia or Mulweeyah, which rises in the Atlas near lat. $32^{\circ} 30'$, flows N. E., and falls into the Mediterranean after a course of 350 m. The lower part of the course of this stream forms the boundary between Morocco and Algeria, as settled by the treaty of 1845; and it is the largest river of the empire which falls into the Mediterranean. There are 7 considerable rivers flowing into the Atlantic. The Fellei, Ziz, and Ghir rise on the E. side of the Atlas and flow S. into the Sahara. N. W. of the Atlas mountains the land slopes gradually toward the sea, and the soil is fertile. The plains which lie to the S. E. of the mountains are rocky and barren, but there are groves of date palms, and the region is called Bilud-ul-Gerid, or the "country of palms." No traces of volcanic agency have been discovered in the geological formation of the country. The lower portions of the Atlas, to the height of 3,000 or 4,000 feet, consist of secondary limestone.—Along the Atlantic coast the climate is temperate, the sea breezes blowing with great regularity, and the mountains sheltering the country from the hot winds of the desert. In this region the thermometer seldom rises above 90° , and rarely falls below 40° . The year is divided into a wet and a dry season; during the former, from November to March, showers are frequent; but during the other part of the year rain seldom falls. Toward the S. there is less rain; and on the S. E. side of the mountains our knowledge of the climate is very imperfect, but extremes of heat and cold are supposed to prevail, and rain to be entirely wanting.—So far as is known, the mineral wealth of Morocco consists of iron, lead, tin, copper, antimony, and salt. Gold and silver are also found in small quantities in some places. Wheat and barley are raised in the plains, beside rice, maize, and durra; the last grain constitutes the principal food of the lower classes.

Cotton, tobacco, sesamum, hemp, saffron, and different kinds of beans and peas are grown. The fruit trees of S. Europe are very common, especially the fig and pomegranate. The plantations of olive and almond trees are very extensive; the date tree is cultivated on the S. declivity of the mountains. The sugar cane thrives under tillage. There are many wild animals, especially in the S. parts. Among the mountains there are numbers of lions, panthers, hyænas, wild boars, gazelles, and antelopes. Locusts are abundant and formidable. Ostriches are found in the deserts, on the S. borders of the country. The domestic animals are very numerous, and the inhabitants pay more attention to rearing cattle than to cultivating the ground. The number of horses is estimated at 400,000, horned cattle at 5,000,000 or 6,000,000, and sheep at 45,000,000; goats are numerous, and there are camels, mules, and asses. The native variety of sheep is much larger than that known in Europe and America, and has a broad tail loaded with fat, often weighing, when the animal is well conditioned, from 30 to 50 lbs. The wool is of fine quality, and almost invariably white.—A great element of both social and political weakness in Morocco lies in the population being composed of several distinct races, of Shelloohs, Berbers, Arabs, Moors, Jews, and negroes. The Shelloohs inhabit the high Atlas plains S. of the capital, and seem to retain traces of a somewhat advanced civilization. They follow agriculture rather than pastoral pursuits. The Berbers claim to be the oldest inhabitants of the country; they occupy part of the Atlas and the mountains of Er Rif, which extend along the Mediterranean, where they are called Riffins, and are divided into several tribes. Such of them as live along the coast have for many ages been addicted to piracy. The Arabs form the bulk of the rural population of the plains, their progenitors having entered the country at the time of the Mohammedan conquest. Some of them cultivate the soil, and are the poorest and most oppressed portion of the population, and some are Bedouins. The Moors are found in the towns bordering upon the sea, and are supposed to be the descendants of the Mohammedans who were expelled from Spain. They are of middling size, and when young rather slender; but they grow so stout as they advance in years, that their chief physical characteristic is their corpulence. It is said that in the harems extreme corpulence is considered as the first of personal attractions. Their natural color is yellow, but from their connections with women of Soodan there are some half-breeds of a much darker complexion. They are the principal people of Morocco with whom traffic by sea is carried on, and their language is mixed up with many Spanish words. The Jews are scattered among all these nations; their condition is best among the Berbers, but they are generally much oppressed and exposed to ignominious treatment. There are many of them in the seaport and commercial towns. The negroes, who are probably less than 200,000 in

number, are brought into Morocco as slaves, but many of them obtain their liberty; and as they are distinguished by fidelity, the emperor's or sultan's body guard is composed of them.—Little attention is paid to agriculture; and as the government discourages all exportation of food to Christian states, no more grain is raised than is required for internal consumption. The cultivator is only nominally assessed at $\frac{1}{10}$ part of the produce, but as the system of administration is exceedingly bad, he is in reality perfectly at the mercy of unprincipled officials, and has no inducement to raise a larger crop than is necessary to supply his wants. The rural population manufacture woollen articles for their own use. In the towns there are some manufactures, and the red caps made at Fez are worn in most countries bordering the Mediterranean. Several kinds of silk goods, linen, and leather are also manufactured at Fez, and the inhabitants are distinguished as goldsmiths, jewellers, and cutters of precious stones. Tanning is well understood, and the leather produced is superior to any made elsewhere. The tanners of Morocco can render the lion's or panther's skin as white as snow and as soft as silk; this is done by plants indigenous to the Atlas and unknown in other parts of the world. The morocco leather of the capital is yellow, that made at Taflet green, and in Fez red. Sole leather of very good quality is made at Rabatt and Tetuan. Silks, embroidered goods, and leather are the staple manufactured goods of the capital. Carpets are chiefly made in the S. districts, and are known in Europe and America as Turkey carpets.—The commerce of Morocco is carried on by means of caravans to Mecca, across the Great Desert to Soodan and the countries of central Africa, and by sea. The greater part of the last is in the hands of the British, from the seaports along the coasts of the Mediterranean and Atlantic. In 1855 the number of vessels entered in the ports of Morocco was: Tangier, 248; Mazagan, 189; Tetuan, 111; Mogadore, 88; Saffi, 84; Casa Blanca, 79; Rabatt, 24; El Araish, 18; total, 886, tonnage 74,879. The total exports amount to about \$2,500,000 annually, and the imports to about \$2,000,000. The exports consist principally of wool, hides, skins, grain, pulse, wax, cattle, sheep, leather, and ostrich feathers; and the chief imports are cotton, linen, muslin, sugar, tea, coffee, and hardware. In 1857, 6,000 bales of American cotton were imported. Communication is extremely difficult in Morocco, as there are no roads except in the neighborhood of the towns, and very few of the rivers have bridges. The traffic is carried on by means of pack animals. The caravan which leaves Fez annually for Mecca assembles about 7 months before the great festival, and occupies that time in dealing with the inhabitants of the countries through which it passes. Indigo, cochineal, fine leather, woollen cloth, and ostrich feathers are the chief articles taken from Morocco by these caravans; and Indian and Persian silks, perfumes, &c., are

brought in return. Some pilgrims proceed by sea to Alexandria on their way to Mecca. The trade with the interior of Africa is carried on from Taflet, and the caravans proceed as far as Timbuctoo. Salt, woollen cloth, Turkish daggers, tobacco, and looking glasses are exchanged for ivory, gold dust, ostrich feathers, pepper, indigo, and slaves. The profits on this traffic are said to be very large.—There are many schools in Morocco where the children are taught reading, writing, and passages from the Koran. There is a university, or as it is called a "house of science," at Fez, where grammar, theology, logic, rhetoric, geometry, and medicine are taught. The arts and sciences are in an exceedingly backward state. Printing is unknown; the music is barbarous; and the once famous public libraries have disappeared. The religion of Morocco is strict Mohammedanism, but Christianity, by late treaties, is tolerated.—The sultan has absolute power over the lives and properties of all his subjects. His revenues are raised by imposts on property, duties on imports and exports, monopolies, and by fines and confiscations.—The territory at present comprehended within the empire of Morocco was, together with part of Algeria, known to the ancients under the name of Mauritania. The Roman writers supposed the inhabitants of the country came from Persia, but it now seems certain that this was not the case. The Romans occupied the sea coasts of Mauritania, and it is not likely that they made any material change in the native population or their habits. From 429 to 587 the Vandals held possession of the country, and are supposed to have introduced the piratical habits which have since prevailed. The Vandals were subdued, and the country appears to have enjoyed tranquillity till toward the close of the 7th century, when the Arabs spread over N. Africa, and the natives of Morocco were either driven to the mountains, or joined with their invaders and adopted their religion and customs. By a decree of the council of Toledo the Jews were expelled from Spain about this time, and many of them sought refuge on the shores of Africa. For nearly 100 years the country remained in a state of great confusion, when Edris, a descendant of Mohammed, was recognized by the different tribes as sovereign of the N. part of Morocco. His son, who succeeded him, founded the city of Fez in 807. The S. part of the country was then in the hands of independent chieftains. In 1055 Abubekr, the chief of a sect of fanatics, was proclaimed sovereign of Morocco. His residence was in Segelmesa or Taflet; but his grandson and successor crossed the mountains, and in 1072 laid the foundations of the city of Morocco and made it the royal residence. In 1202 Fez and some of the other districts asserted their independence, and the dynasty of Abubekr came to an end. The Mohammedan conquerors of Spain were driven back to Morocco in 1492, and the century following the country was again united under one emperor. The em-

pire was soon afterward extended to the confines of Timbuctoo, but fell to pieces in the beginning of the 17th century. Another dynasty was established in 1648, by Muley Sherif el Fiheli, king of Tafilet, whose descendants are still the reigning family. In 1814 the emperor of Morocco abolished the slavery of Christians throughout his dominions; and in 1817 he disarmed his marine and strictly prohibited piracy. In 1844 Abd el Kader, being hard pressed in Algeria, incited the Moors to make war upon the French, when the prince de Joinville bombarded Tangier and took possession of Mogadore; but upon peace being concluded the same year, that town was given up. New complications with France arose in 1851 on account of the plunder of a French vessel wrecked on the coast. Salee was bombarded by Rear-Admiral Dubourdien, Nov. 26, 1851, and peace was only concluded March 23, 1852, after compensation had been made by the sultan. The power of the sultan has been greatly weakened by internal disorders, and latterly the tranquillity of the empire has been much disturbed. The Rif pirates recommenced their depredations, and in 1856 the French government obtained compensation from the sultan, which was the first instance of redress being peaceably granted. The Spanish establishments on the coast of Morocco, at Melilla, Alhucemas, and Peñon de Velez, had repeatedly suffered from these outrages; and difficulties existed for some years in consequence between the two governments. (See Richardson's "Travels in Morocco," edited by his widow, London, 1859.) Soon after the accession of the present sultan Sidi Mohammed, who succeeded his father Abderrahman Sept. 6, 1859, the French made an incursion into the territory of Morocco, to revenge certain outrages committed along the Algerian frontier by the tribe of Beni-Suassan. The campaign lasted about a month, closing in the early part of November, and was attended with success on the part of the French. In the mean time Spain had demanded satisfaction for a series of attacks upon her commerce by the Rif pirates, and for an insult to the Spanish flag at Ceuta in Aug. 1859. The sultan disclaiming all responsibility for the acts in question, which he declared to have been committed by rebels, war was declared by Spain, Oct. 22, and a large army under command of Marshal O'Donnell was at once set in motion. The first division landed at Ceuta on the night of Nov. 18, and after repelling an attack of the enemy intrenched themselves at El Serrallo close to that city. From this time up to the close of the year the Spaniards had to sustain constant attacks on their lines, which they did not repulse without heavy losses. The sultan proclaimed a "holy war," and his soldiers fought with a courage and enthusiasm worthy of the Moors of Granada. On Dec. 30 the Spanish fleet destroyed the forts at the mouth of the river Tetuan, and on Jan. 1 O'Donnell commenced his march toward Tetuan. On the 2d Gen. Prim defeated the whole Moorish line,

40,000 strong, with a loss to the Moors of about 1,500 and to his own army of 600. About Feb. 1, O'Donnell, having consumed a month in marching a distance of 21 miles, occupied the heights about Tetuan, and on the 4th fought a great battle which resulted in the capture of the enemy's camp and the surrender of the city on the following day. For this exploit he received the title of duke of Tetuan, and a grant from Queen Isabella of the ground on which the action was fought. The remaining events of the campaign, with the exception of the bombardment of Arzila and El Arish on the Atlantic coast, were of trifling importance. On March 25 preliminaries of peace and an armistice were agreed upon, and a definitive treaty was signed April 27. The emperor guaranteed to the queen of Spain an indemnity of 20,000,000 piasters for the expenses of the war; ceded to her majesty "all the territory comprised from the sea following the heights of Sierra Bullones as far as the road of Anghera," together with other territory about Santa Cruz; granted permission for a Spanish minister to reside at Fez, or wherever else might be found most convenient to Spain, and for a missionary house to be opened at Fez; and promised favorable commercial regulations. The value of the ceded territories amounts to about 800,000,000 reals.

MOROCCO, the capital of the empire of Morocco, situated on the N. side of an extensive and fertile plain 1,500 feet above the sea, 4 m. S. of the river Tensift, in lat. 31° 38' N., long. 7° 36' W.; population variously estimated between 50,000 and 80,000. It is nearly 6 m. in circuit, and is surrounded by a strongly built wall of taccia work (lime beaten in a case with earth) 30 feet high, with foundations of masonry, and square towers every 50 yards. In the walls there are 11 gates. The space within is only partially built upon, and there are large gardens and open areas of from 20 to 30 acres. The streets are narrow, irregular, unpaved, and in wet weather exceedingly dirty. The houses are generally one story high, built in the same way as the walls of the city, whitewashed, and have flat roofs and terraces. The apartments front upon a court, and toward the street there are unglazed openings for windows; but the interior arrangements are much in the Spanish style. Many of the doors are of cypress wood elegantly carved. There are several open market places throughout the city, beside which there is a covered bazaar where articles of all descriptions are offered for sale. There are 19 mosques, several of which are remarkable for size and elegance. Outside the walls, on the S. of the town, stands the palace, occupying a space of about 1,500 yards long by 600 wide, encircled by a strong wall. The whole is laid out in gardens, round which are detached pavilions forming the sultan's residence. The Jews are the only goldsmiths, tinmen, and tailors in Morocco; they are said to be generally rich, though they make an outward appearance of poverty. The Moors are the shoemakers, carpen-

ters, masons, smiths, and weavers. There are several tanning and leather dyeing establishments, one of which is said to employ 1,500 hands. There are ruins of extensive aqueducts in the vicinity of the town, some of them 20 m. in length; and there are several large cemeteries outside the walls, one of which is upward of 100 acres in extent. Nearly half the town is now in ruins.

MORPHEUS (Gr. *μορφας*, to shape), in Grecian mythology, the son of Sleep and god of dreams. He is represented in a reclining posture, with a crown of poppies.

MORPHIA. See **OPIMUM**.

MORPHY, PAUL CHARLES, an American lawyer, celebrated as a chess player, born in New Orleans, La., June 22, 1837. His grandfather was a native of Madrid in Spain, who emigrated to America and settled in Charleston, S. C. His eldest son, the father of Paul, removed to New Orleans at an early age, and studied law under Edward Livingston; he was attorney-general, twice a member of the state legislature, and afterward became a judge in the supreme court of Louisiana, and died in 1856. Paul Morphy early exhibited a fondness for the game of chess, and at the age of 10 years was taught the moves and powers of the pieces by his father; two years later he had encountered successfully the best amateurs of his native city. After fitting himself by several years' study at an academy in New Orleans, he entered St. Joseph's college in 1850, and remained there 5 years. In 1855 he entered a law school, and in 1857 was admitted to practice at the Louisiana bar when he should have completed his 21st year. During his collegiate course he had continued his interest in the game of chess, and had exhibited his already remarkable skill in various contests with Eugene Rousseau, his uncle Ernest Morphy, and Löwenthal, defeating them in a majority of games; and when in 1857 Mr. Daniel W. Fluke of New York projected the chess congress, one of his first acts was to invite the attendance of the young player. At the congress Mr. Morphy defeated in a majority of games, many being at considerable odds, the first players of the United States. In December Mr. Morphy returned to New Orleans, and shortly after published a challenge to the whole American chess community to play him at the odds of pawn and move; the challenge was never accepted. During the following season Mr. Morphy first exhibited his ability to play without seeing the board, sometimes conducting as many as 7 games at one time. In 1858 a committee of the New Orleans chess club sent a letter to Mr. Staunton, the champion of English chess, inviting him to play a match with Mr. Morphy for a stake of \$5,000, and accompanying the invitation with the agreement that should the English player lose the match, the sum of \$1,000 was to be paid him out of the stakes in reimbursement of the expenses incurred by him. Mr. Staunton declined the invitation on the ground of the distance.

Mr. Morphy afterward decided to visit England and the continent, and in June of the same year sailed from New York. In London he continued the round of success which had characterized his previous efforts, and even defeated Mr. Löwenthal, whose strength had greatly increased since their previous play; 14 games were played, of which Mr. Morphy won 9 and Löwenthal 3, 2 being drawn. Mr. Staunton, who had frequently promised to meet Mr. Morphy, postponed the conflict from day to day, and, except in consultation games, they never met. On Aug. 26 Mr. Morphy attended the annual meeting of the British chess association at Birmingham, where he played 8 games simultaneously without seeing the boards, winning 6 games and losing one, and one being drawn. In September he went to Paris, where he first played a match of 7 games with Mr. Harrwitz, winning 5 and drawing one, whereupon the match was resigned by Mr. Harrwitz on the plea of indisposition. After defeating the best French players at the *café de la régence*, including Rivière, Laroche, Journoud, and Devinck, he encountered on Dec. 20 the celebrated Adolph Anderssen, considered the champion of German chess. The result of the match was: Morphy 7, Anderssen 2, drawn 2. Mr. Morphy continued in Paris playing with his usual success until April 4, when a farewell banquet was given him, at which his bust was crowned with laurel by the French players. Leaving Paris, he returned to London, and during the remainder of his stay exhibited his power in matches and in blindfold play as before. On April 30 he sailed from Liverpool for New York. His career in Europe had been one of continued triumph. His urbanity and gentleness of manners had endeared him to all his adversaries, who exhibited their regard by public dinners and ovations wherever he went. Mr. Morphy has never adopted chess playing as a profession, and latterly he has played but rarely, devoting himself almost exclusively to his profession, the practice of which he has resumed at New Orleans.

MORRIS, a N. co. of N. J., bounded N. E. by the Pequonnock river, E. and S. E. by the Passaic, and drained by Rockaway and Whippany rivers and the head branches of the Raritan; area, 650 sq. m.; pop. in 1855, 82,493. The surface is traversed by ranges of hills, some of which, as Schooley's and W. Trowbridge mountains, reach a considerable elevation. It abounds in valuable minerals, among which are copper, iron, zinc, marble, limestone, sandstone, and manganese; there are 6 iron mines which yield large quantities of metal, giving employment to a great number of the inhabitants. The productions in 1850 were 524,866 bushels of Indian corn, 281,381 of oats, 135,271 of potatoes, 61,326 of wheat, 41,213 lbs. of wool, 774,591 of butter, and 39,091 tons of hay. There were 23 grist mills, 33 saw mills, 7 woolen factories, 3 founderies, 36 forges, 5 paper mills, 13 tanneries, 8 newspaper offices, 42

churches, and 5,589 pupils attending public schools. It is intersected by the Morris canal and the Morris and Essex railroad, the latter passing through the capital, Morristown.

MORRIS, CHARLES, an American naval officer, born in Connecticut in 1784, died in Washington, D. C., Jan. 27, 1856. He entered the navy as a midshipman in July, 1799, and during the war with Tripoli, 1801-'5, served with distinction in the squadron of Commodore Edward Preble. He prominently participated in the expedition commanded by Decatur which destroyed the frigate *Philadelphia* in the harbor of Tripoli on the night of Feb. 15, 1804. In Jan. 1807, he was promoted to a lieutenantcy, and in the war of 1812 served as 1st lieutenant of the frigate *Constitution*, distinguishing himself during the chase of that ship for 8 days and nights by a British squadron in July, 1812, and by his gallantry in the action between the *Constitution* and *Guerriere* on Aug. 19, in which he received a very severe wound. He was promoted to the rank of captain, passing the grade of master commandant; and in 1814 he was appointed to the command of the *Adams* of 28 guns, in which ship he made an important cruise upon the coasts of the United States and Ireland, harassing British commerce very much. In August, 1814, the scurvy appeared on board, and the ship having been much injured by running on shore in thick weather upon Haute Isle, Capt. Morris entered the Penobscot river in Maine, and running up to Hampden made preparations to heave out for repairs. While engaged in this, a strong British expedition entered the river to capture the ship, and a militia force assembled for her protection giving way, nothing remained for Capt. Morris but to destroy her, which he did, directing his crew to break up into small parties and make their way for 200 m. across the thinly inhabited country to Portland. This order was strictly obeyed, every man reporting himself at Portland in due time. After the peace with England Commodore Morris continued in active employment either afloat or on shore, being off duty but about 2½ years in a professional career of 57. He served 21 years at sea, commanding four squadrons on foreign stations, 8 years in command of different navy yards, 11 years as navy commissioner, and 8 years as chief of a bureau. At the time of his death he was at the head of the bureau of ordnance and hydrography.

MORRIS, GEORGE F., an American poet and journalist, born in Philadelphia, Oct. 10, 1802. At an early age he removed to New York, where he commenced his literary career by writing for the journals, particularly the "New York Gazette" and the "American," to the first of which he contributed verses as early as his 15th year. In Aug. 1823, in conjunction with Samuel Woodworth, he commenced the publication of the "New York Mirror," which was discontinued Dec. 31, 1842, under the financial disasters of the times. It employed some of the best literary talent of the country, including

among its contributors Bryant, Halleck, Paulding, Leggett, Hoffman, Fay, and Willis, and stood probably at the head of periodicals of its class. In 1843 Mr. Morris associated himself with Mr. Willis in the publication of the "New Mirror," of which 8 volumes were issued, and in 1844 established the "Evening Mirror," a daily paper, in which he was assisted by Mr. Willis and Mr. Hiram Fuller. At the close of 1845 he commenced alone a weekly journal called the "National Press," the title of which was in Nov. 1846, changed to that of the "Home Journal," since which time it has been conducted by himself and Mr. Willis. As a song writer, however, rather than a journalist, Mr. Morris has acquired his chief reputation; and his lyrical efforts, produced at intervals during his literary career down to the present time, have gained a wide popularity. Of his "Woodman spare that Tree" several millions of copies are said to have been circulated; and others, as "We were boys together," "Land-Oh!" "Long Time Ago," "The Origin of Yankee Doodle," "My Mother's Bible," "Whip-Poor-Will" &c., have proved sources of great profit to their publishers. The melodies with which many of these songs are identified have been written for them by Balfe, Sir John Stephenson, Sir Henry Bishop, and other English composers; and Malibran, Braham, Russell, Sinclair, Dempster, and Madame Anna Bishop have sung them in public. Various editions of his poems have been published, including one in 1840 with illustrations by Weir and Chapman (3d ed., 8vo., New York, 1848), a miniature volume in 1846, and a more complete edition in 1860. In 1853 Mr. Morris also published a volume entitled "The Deserted Bride and other Poems" (8vo., New York), and he has edited a volume of "American Melodies," consisting of songs by upward of 250 American writers, and, in conjunction with Mr. Willis, the "Prose and Poetry of Europe and America" (8vo., New York). In 1837 he produced a successful drama founded on incidents in the American revolution, entitled "Briercliff;" and in 1842 he wrote the libretto of "The Maid of Saxony," an opera set to music by Charles E. Horn. He has also published a volume of prose sketches entitled "The Little Frenchman and his Water Lots" (1838). Mr. Morris has resided for many years at Undercliff, a country seat on the Hudson river, nearly opposite West Point, and has been a brigadier-general in the New York state militia.

MORRIS, GOUVERNEUR, an American statesman, born in Morrisania, Westchester co., N. Y., Jan. 31, 1752, died Nov. 6, 1816. Little is known of his early years. He was graduated at King's (now Columbia) college in 1768, and immediately entered the law office of William Smith, the historian of the province. In May, 1771, he was admitted to practice. At the age of 18 he wrote a series of newspaper articles in regard to finance, which attracted much attention; and when the revolutionary war began, he had already become distinguished. In

May, 1775, he was elected a delegate to the provincial congress of New York, of which he continued a member for nearly 8 years. While in that position he made a report upon the mode of emission of a paper currency by the continental congress, which was forwarded to congress, and its leading suggestions were afterward carried out; and he was a member of the committee for drafting a constitution for the state of New York. He was elected a delegate to the continental congress in 1777, and in October joined that body, then sitting at York, Penn., and passed the following winter at Valley Forge as one of a committee appointed to examine, with Washington, into the state of the army. In Feb. 1779, he was chairman of the committee "to consider the despatches from the American commissioners abroad, and communications from the French ministers in the United States," whose report formed the basis of the treaty of peace afterward adopted; and in the same year he published a pamphlet entitled "Observations on the American Revolution." While residing in Philadelphia, in May, 1780, he was thrown from his vehicle, and his leg injured so severely as to require amputation. In July, 1781, he was chosen by Robert Morris as assistant superintendent of finance, which office he held for 8½ years. After the revolution he began again the practice of law, and also engaged with Robert Morris in mercantile speculations. On the death of his mother in 1786, he purchased the patrimonial estate at Morrisania from his brother. In 1787 he published an address to the assembly of Pennsylvania, taking strong ground against the projected abolition of the bank of North America. He was a delegate from Pennsylvania to the U. S. constitutional convention of 1787, in which he took a conspicuous part; he was one of the committee of 5 appointed to draft the constitution, and according to Madison the finish given to the style and arrangement of that instrument fairly belongs to him. Mr. Morris sailed for France on business in Dec. 1788, and while there kept a minute diary, full of valuable details. In 1791 he was appointed by Washington secret agent to England in order to settle unfulfilled terms of the old treaty; he remained in London till September, but his efforts were not attended by any result. In 1792 he was appointed minister plenipotentiary to France, and during the revolution conducted himself with great prudence, although his sympathies were not with the more democratic side. He served until Oct. 1794, when he was recalled at the request of the French government, travelled in Europe until the autumn of 1798, and while at Vienna endeavored to effect the liberation of Lafayette from his prison at Olmütz. In 1800, having taken up his residence at Morrisania, he was elected by the legislature of New York to fill a vacancy in the U. S. senate, and served with distinction in that body until 1808, acting then and afterward with the federalists. He spent the latter years of his life in retirement,

dispensing a liberal hospitality, and maintaining a correspondence with literary and public men in Europe and America. He delivered funeral orations on Washington, Hamilton, and Gov. George Clinton; in 1812 an oration before the New York historical society; in 1814 an address in celebration of the deliverance of Europe from the yoke of military despotism, which attracted attention on account of its peculiar views; and in 1816 an inaugural oration before the historical society on his appointment as president. He was a powerful orator, and possessed an excellent delivery, though his style was somewhat florid. In person his resemblance to Washington was so close that he stood as a model of his form to the sculptor Houdon. Mr. Morris was one of the earliest promoters of the project for constructing the Erie canal, and in the summer of 1810 he examined the route to Lake Erie. He was chairman of the canal commissioners from their first appointment in March, 1810, until near the end of his life. His life, with selections from his correspondence and miscellaneous papers, has been written by Jared Sparks (8 vols. 8vo., 1832).

MORRIS, LEWIS, one of the signers of the declaration of independence, born at Morrisania, Westchester co., N. Y., in 1726, died Jan. 22, 1798. After being graduated at Yale college in 1746, he engaged in farming on a very extensive scale on his paternal estate at Morrisania. He took strong ground against the act of parliament compelling the inhabitants of the province of New York to furnish with supplies the foreign troops quartered upon them. He was elected to the congress of 1775, and was a member of the committee to devise means for supplying the colonies with munitions of war. After the close of the session he was sent west to detach the Indians from the British. In 1776 he resumed his seat in congress, and signed the declaration of independence, although his estate was at that time in the hands of the enemy. As a consequence his manor was laid waste, and his family expelled. In 1777 he was succeeded in congress by Gouverneur Morris, his half brother, but afterward served in the state legislature. The latter part of his life was spent at Morrisania. He was one of the boldest and most zealous promoters of the revolution.

MORRIS, ROBERT, an American financier, and one of the signers of the declaration of independence, born in Lancashire, England, Jan. 20, 1784, died in Philadelphia, May 8, 1806. When 18 years old he came to America, and before he was 15 was placed in the counting house of Charles Willing, a merchant of Philadelphia. In 1754 he entered into partnership with the son of his employer. The firm continued until 1793, and at the beginning of the revolution was more largely engaged in commerce than any other in Philadelphia. Mr. Morris zealously embraced the American cause, opposed the stamp act, and signed the non-importation agreement of 1765, in consequence of which his business suffered seriously. He was

elected a delegate to the congress of 1775, and served on the committees to devise ways and means for furnishing the colonies with military stores and with a naval armament, and was a member of the naval committee appointed to carry the plan of such an armament into execution. On July 1, 1776, he voted against the declaration of independence, and on the 4th refused to vote at all, considering the time inappropriate. He was reelected to congress on the 20th of the same month, and again in 1777. At this period he was largely employed in managing the fiscal affairs of the country. On his personal responsibility he frequently borrowed large sums for the use of the government, which, on account of the known state of the treasury, could not have been procured in any other way. During the session of congress at York, Penn., it was insinuated that the house of Willing, Morris, and co. had been engaged in fraudulent proceedings to the detriment of the public; but in the investigation which followed, it was entirely exonerated from suspicion. In 1780 Mr. Morris, in conjunction with other citizens of Philadelphia, established a bank, by means of which 8,000,000 rations of provisions and 800 hogsheads of rum were forwarded to the army. On Feb. 20, 1781, he was unanimously elected superintendent of finance, and by subsequent resolutions of congress was invested with almost the entire control of the financial affairs of the government. At this time the treasury was more than \$2,500,000 in debt, the army was destitute, and the credit of the country exhausted. One of his first acts was to establish the bank of North America, which was incorporated by congress Dec. 31, 1781, and went into operation Jan. 7, 1782, with a capital of \$400,000. Pennsylvania and several other states soon afterward passed laws to protect and facilitate its operations; and it proved very efficient in relieving the government of its embarrassments. During the financial administration of Mr. Morris, he several times pledged his private credit for public supplies, being reputed much wealthier than he really was. In the beginning of 1781 he furnished the suffering army with several thousand barrels of flour; and in the campaign of that year he supplied nearly every thing required for the expedition against Cornwallis. For this purpose he issued his own notes to the amount of \$1,400,000, which were finally all paid. But, harassed by the claims of the public creditors, and indignant at the indisposition of the several states to fulfil their engagements, Mr. Morris, in Jan. 1783, informed the president of congress that, as nothing but the public danger could have induced him to accept the office of superintendent of finance, so little apprehension was now entertained of the common enemy that his original motives had ceased to operate; that circumstances had postponed the establishment of the public credit; and that it did not consist with his ideas of integrity to increase the national debt while the prospect of paying it was dimin-

ishing. He therefore resigned, but consented to serve until May 1, and did not finally withdraw until Nov. 1784. On May 6, 1784, congress at his urgent request appointed a board of three commissioners to superintend the treasury, and a committee to inspect the conduct of the department. In giving an account of his administration, he published a long and able address to the people of the United States. Before he resigned he issued a public notice pledging himself personally to provide for his various engagements in behalf of the government. On Sept. 7, 1781, congress had resolved that until an agent of marine should be appointed all the duties of that office should devolve upon the superintendent of finance; and no agent being appointed, Mr. Morris was unwillingly compelled to regulate the affairs of the navy until the close of 1784. The charter of the bank of North America having been annulled by the assembly of Pennsylvania, he was one of the representatives sent from Philadelphia in 1786 to the legislature for the purpose of obtaining a renewal. The effort failed of success then; but in the succeeding legislature the charter was renewed. In 1787 he was elected a member of the convention which framed the federal constitution; and on Oct. 1, 1788, he was elected a member of the first U. S. senate. The post of secretary of the treasury was offered to Mr. Morris by Washington, but was refused; and on being asked to designate a person for the station, he named Alexander Hamilton. On the conclusion of the war he was one of the first to engage in the East India and China trade, forming a partnership for that purpose with Gouverneur Morris, and in the spring of 1784 sent to Canton the first American vessel that ever appeared in that port. In his old age he engaged largely in land speculation, in consequence of which he lost his fortune, and during the latter years of his life was confined in prison for debt. Although he received only an English education, Mr. Morris was an impressive public speaker and an able writer.

MORRIS, THOMAS, an American statesman, born Jan. 8, 1776, died Dec. 7, 1844. He was the son of a Baptist minister of Welsh descent, and his early life was passed in western Virginia, whence he removed in 1795 to Columbia, O., and was employed by the Rev. John Smith, the first senator in congress from Ohio. Having married, he fixed his residence in 1800 in Clermont co., O., studied law, was admitted to the bar, was a member of the state legislature from 1806 to 1830, was chosen a judge of the supreme court, and in 1832 was elected a senator in congress, where he distinguished himself as an opponent of slavery, and was engaged in important debates with Mr. Calhoun and Mr. Clay in defence of the right of petition and of the duty of the general government to discourage slavery. His anti-slavery sentiments being distasteful to the democratic party, by which he had been elected, he was not reelected, and retired from congress in March, 1839. In Aug.

1843, the liberty party at Buffalo nominated him for vice-president, with James G. Birney for president. He died a month after the election. Dr. Gamaliel Bailey in announcing his death said: "He was one of the most energetic and independent of our politicians. The cause of human rights, to which he had devoted his latter days, has lost one of its most fearless champions. His noble stand in defence of liberty in the United States can never be forgotten." His life and speeches have been published by his son, the Rev. B. F. Morris.

MORRIS, THOMAS A., D.D., an American clergyman, and bishop of the Methodist Episcopal church, born in Kanawha co., Va., April 28, 1794. He was received as a travelling preacher into the Ohio conference in 1817; was ordained deacon by Bishop George, and subsequently as an elder by Bishop Roberts; was an itinerant preacher in Ohio, Kentucky, and Tennessee, and when the "Western Christian Advocate" was established at Cincinnati in 1833, was elected as its editor, which post he filled with great credit until 1836, when he was elected by the general conference a bishop of the M. E. church. The degree of D.D. was conferred upon him by McKendree college, Ill., in 1841.

MORRIS DANCE, an old English dance, usually performed with castanets, tabor, staves, or swords, by young men lightly dressed, with bells fixed about their legs, and parti-colored ribbons streaming from their arms and shoulders. It is supposed to be derived from the Morisco or Moorish dance, which is still popular in Spain under the title of the fandango. It may have been introduced into England when John of Gaunt returned from Spain in the reign of Edward III., but Douce believes it to have been borrowed from the French or Flemings. It can be traced as early as the reign of Henry VII., when it was one of the sports not only of May day, but of other festivals, as holy Thursday, the Whitsun ales, and weddings. In the May games the morris was often performed by Robin Hood, Little John, Friar Tuck, Maid Marian, the fool, Tom the piper, and the hobby-horse. The May festivities of Robin Hood were chiefly designed for the encouragement of archery, and it is not certain that either he or his companions were prominent in the dance, which was an entirely distinct merriment. Maid Marian is supposed to represent his mistress, but the part was often filled by a boy dressed in a girl's habit, who was queen of the May. It was once usual for the queen to be splendidly attired, but after the degeneracy of the dance the character was personated by a clown who obtained the name of Malkin. Friar Tuck maintained his place in the sport till the reign of Elizabeth, but is not heard of afterward. The fool bore as badges of his office a bauble in his hand, and a coxcomb hood with asses' ears on his head. Tom the piper was a minstrel of the superior order, with a complicated red, blue, and yellow dress, a sword, a feather in his cap, and a tabor, ta-

bor stick, and pipe to distinguish his profession. The hobby-horse was designed for antics and tricks of legerdmain. A curious tract appeared in 1609 describing a morris dance in Herefordshire, in which the combined ages of the 12 performers was 1,200 years. Mr. Brand describes a recent celebration in the same place by 8 men whose combined ages were 800 years. During the reign of Elizabeth the Puritans checked the May pastimes by their invectives against "the terrestrial furies" which indulged in them. Friar Tuck, Maid Marian, and the hobby-horse were declared remnants of popish and pagan superstition. The last two were restored by King James's "Book of Sports," but were again degraded during the commonwealth. The morris dance has, however, continued in parts of England nearly to the present time. Shortly before the first revolution in France it was celebrated in many parts of that country, accompanied by a fool and a hobby-horse (*un chevalot*).—The fullest account of the subject is that by Douce, in a dissertation accompanying his "Illustrations of Shakespeare."

MORRISON, ROBERT, D.D., an English missionary, born in Morpeth, Northumberland, Jan. 5, 1782, died in Canton, Aug. 1, 1884. After receiving an elementary English education, he was apprenticed to his father as a last maker; but having studied religious books during his leisure hours, he entered on a regular theological course in 1801, under a Presbyterian clergyman of Morpeth, who in 1803 obtained him admission into the Independent academy at Hoxton. In 1804 he offered his services to the London missionary society; and his offer being accepted, he removed in 1805 to the mission college at Gosport, and commenced the study of Chinese. In the winter of 1807 he was ordained, and in the following autumn arrived at Canton. The next year he was nominated translator to the East India company's factory at Canton, and at the same time was making preparations for translating the Scriptures into Chinese. The New Testament appeared in 1814, and the Old Testament, executed with the assistance of Mr. Milne, in 1818. In November of the latter year Mr. Morrison caused the foundation of an Anglo-Chinese college at Malacca. In 1823 he returned to England, where the royal society admitted him to membership. In 1826 he sailed once more for China, and there passed the rest of his life. His Chinese grammar (4to., Serampore, 1815) and his Chinese dictionary (5 vols., Macao, 1815-'28) were his chief original works. His "Memoirs," compiled by his widow, were published in London in 1839, in 2 vols. 8vo.

MORRISTOWN, the capital of Morris co., N. J., on the Whippany river, and on the Morris and Essex railroad, 50 m. N. N. E. from Trenton, and 28 m. by railroad from New York; pop. of the township in 1860, 6,024. The village is built on an elevated plain commanding beautiful views of the surrounding country. The streets are regularly laid out, the houses neatly built,

and there is a public square in the centre. It contains a court house, 2 banks, an academy, several manufactories, and 7 churches (1 Baptist, 2 Episcopal, 1 Methodist, 2 Presbyterian, and 1 Roman Catholic).

MORROW, a central co. of Ohio, drained by the head streams of Vernon and Olentangy or Whetstone rivers; area, 870 sq. m.; pop. in 1850, 20,280. The surface is undulating and the soil highly fertile. The productions in 1850 were 366,679 bushels of Indian corn, 81,925 of wheat, 173,795 of oats, 19,428 tons of hay, and 184,895 lbs. of wool. There were 8 grist mills, 14 saw mills, 1 foundry, 56 churches, and 1,268 pupils attending public schools. It is intersected by the Cleveland, Columbus, and Cincinnati railroad. A large quarry of freestone is worked near the capital, Mount Gilead.

MORROW, JEREMIAH, a western pioneer, born in Pennsylvania in 1770, died in Ohio, March 22, 1852. In 1795 he removed to the North-West territory, and in 1802 was elected a delegate to the convention for forming the state constitution of Ohio. He was the first representative in congress from that state, and then served as U. S. senator from 1813 to 1819. From 1822 to 1826 he was governor, then canal commissioner, and from 1841 to 1843 was again a member of congress.

MORSE. See WALKER.

MORSE, I. JEDIDIAH, D.D., an American clergyman and geographer, born in Woodstock, Conn., Aug. 28, 1761, died in New Haven, June 9, 1826. He was graduated at Yale college in 1783; was licensed to preach in 1785, by the New Haven association of Congregational ministers; in 1786 was tutor in Yale college; the same year was ordained a minister of the gospel; and in 1789 was installed as pastor of the first Congregational church in Charlestown, Mass. In 1794 he received the honorary degree of D.D. from the university of Edinburgh. He was an active member of the Massachusetts historical society, and numerous other literary and scientific bodies. Dr. Morse is known as the father of American geography. He prepared in 1784, at New Haven, for the use of a school of young ladies, a small 18mo. geography, which was the first work of the kind published in America. This was followed by larger works in the form of systems of geography and gazetteers containing full descriptions of the country from materials obtained by travelling and extensive correspondence. Jeremy Belknap, the historian of New Hampshire, Thomas Hutchins, geographer-general of the United States, Ebenezer Hazard, and others, who had contemplated the same task, gracefully yielded their pretensions in his favor, even contributing to his use the materials they had gathered; and for 80 years he remained without an important competitor in this department of science. Reprints of the early editions of his larger geographical works were published in Great Britain, and French and German translations of them in Paris and Hamburg. Much of Dr. Morse's life was

spent in religious controversy—in maintaining the orthodox faith in the New England churches against the approaches of Unitarianism. For this purpose, among other measures, he engaged actively in the enlargement in 1804 of the Massachusetts general association of Congregational ministers, a body whose basis is the Westminster assembly's catechism; in 1805, as a member of the board of overseers, he opposed, though unsuccessfully, the election of the Rev. Henry Ware, D.D., to the Hollis professorship of divinity in Harvard college; the same year he established, and for the 5 following years conducted, as sole editor, the "Panoplist," a monthly religious journal; he was a prominent actor in the establishment of the theological seminary at Andover, especially by his successful efforts to prevent the threatened establishment of a rival institution at Newbury, projected by the Hopkinsians, and to effect a union between them and other Calvinists on their common symbol, the assembly's catechism, the articles of this union still constituting substantially the basis of the Andover seminary, and being signed in his own study in Charlestown, in the night of Nov. 30, 1807, by himself, Dr. Samuel Spring, and Dr. Eliphalet Pearson, the three men empowered for the purpose by the wealthy donors; he participated in the organization of the Park street church in Boston in 1808, when all the Congregational churches of that city, except the Old South church, had abandoned the primitive faith of the fathers of New England. His persevering opposition to the so-called "liberal" views of religion brought on him a persecution, which affected deeply his naturally delicate health; and in 1820 he resigned his pastoral charge, for the quiet of his New Haven home, which he occupied till his death. In 1820 he was commissioned by the U. S. government to visit the Indian tribes on our N. W. borders; and the record of his labors, embodied in an 8vo. volume of 400 pages, was published in 1822 under the title of "Indian Report," &c. Beside numerous editions of his geographical works, Dr. Morse also published "A Compendious History of New England," in conjunction with Elijah Parish, D.D. (Cambridge, 1804; 3d ed. enlarged, 1820); "Annals of the American Revolution" (Hartford, 1824); and, from 1790 to 1821, 25 sermons and addresses on special occasions. II. SAMUEL FINLEY BRESEE, an American artist and inventor, the eldest son of the preceding, born in Charlestown, Mass., April 27, 1791. He was graduated at Yale college in 1810, and went to England with Washington Allston in 1811 to study painting under his tuition and that of Benjamin West. In 1813 he received the gold medal of the Adelphi society of arts at the hands of the duke of Norfolk, for an original model of a "Dying Hercules," his first attempt at sculpture. He returned to the United States in 1815, and in 1824-'5, with some other artists of New York, organized a drawing association, which, after two years' struggle against various obstacles, resulted in

the establishment in 1826 of the present "National Academy of Design." Mr. Morse was chosen its first president, and was continued in that office for 16 years. In 1829 he visited Europe a second time to complete his studies in art, residing for more than 3 years in the principal cities of the continent. During his absence abroad, he had been elected to the professorship of the literature of the arts of design in the university of the city of New York; and in 1835 he delivered a course of lectures before that institution on the affinity of those arts. While a student in Yale college Mr. Morse had paid special attention to chemistry, under the instruction of Prof. Silliman, and to natural philosophy under that of Prof. Day; and these departments of science, from being subordinate as a recreation, at length became a dominant pursuit with him. In 1826-'7 Prof. J. Freeman Dana had been a colleague lecturer in the city of New York with Mr. Morse at the Athenæum; the former lecturing upon electro-magnetism and the latter upon the fine arts. They were intimate friends, and in their conversations the subject of electro-magnetism was made familiar to the mind of Morse. The electro-magnet on Sturgeon's principle (the first ever shown in the United States) was exhibited and explained in Dana's lectures, and at a later date, by gift of Prof. Torrey, came into Morse's possession. Dana even then suggested by his spiral volute coil the electro-magnet of the present day; this was the magnet in use when Morse returned from Europe, and it is now used in every Morse telegraph throughout both hemispheres. He embarked in the autumn of 1832 at Havre on board the packet ship *Sully*; and in a casual conversation with some of the passengers on the then recent discovery in France of the means of obtaining the electric spark from the magnet, showing the identity or relation of electricity and magnetism, Morse's mind conceived not merely the idea of an electric telegraph, but of an electro-magnetic and chemical recording telegraph, substantially and essentially as it now exists. The testimony to the paternity of the idea in Morse's mind and to his acts and drawings on board the ship is ample. His own testimony is corroborated by all the passengers (with a single exception) who testified with him before the courts, and was considered conclusive by the judges; and the date of 1832 is therefore fixed by this evidence as the date of Morse's conception, and realization also, so far as drawings could embody the conception, of the telegraph system which now bears his name. But though thus conceived and devised as early as 1832, in the latter part of which year, on reaching home, he made a portion of the apparatus, yet circumstances prevented the complete construction of the first recording apparatus in New York city until the year 1835; and then it was a rude single apparatus, sufficient indeed to embody the invention, and enable him to communicate from one extremity of two distant points of a circuit of half a mile, but not back

again from the other extremity. This first instrument was shown in successful operation to many persons in 1835 and 1836. For the purpose of communicating from, as well as to, a distant point, a duplicate of his instruments was needed, and it was not until July, 1837, that he was able to have one constructed to complete his whole plan. Now he had two instruments, one at each terminus, and could therefore communicate both ways; whereas before, with but one instrument, he could signal to one terminus only, and receive no answer. Hence, early in Sept. 1837, having his whole plan thus arranged, he exhibited to hundreds the operation of his system at the university in New York. From the greater publicity of this latter exhibition, the date of Morse's invention has erroneously been fixed in the autumn of 1837, whereas he has been proved by many witnesses to have operated successfully with the first single instrument as early as Nov. 1835. After the summer of 1837 it was in a condition to be submitted to the inspection of congress; and consequently we find Mr. Morse in the latter part of that year, and at the beginning of 1838, at Washington, asking that body for aid to construct an experimental line from Washington to Baltimore to show the practicability and utility of the telegraph. Although the invention, by its successful results before the congressional committees, awakened great interest, yet from the scepticism of many, and the ridicule of others, it was doubtful whether the favorable report of the committee would command a majority of congress in its favor. The session of 1837-'8 closed without any result, when the inventor repaired to England and France, hoping to draw the attention of the European governments to the advantages of his invention to them, and also to secure a just reward to himself. The result of this visit was a refusal to grant him letters patent in England, and the obtaining of a useless *brevet d'invention* in France, and no exclusive privilege in his invention in any other country. He returned home to struggle again with scanty means for 4 years, not discouraged, but determined to attempt again to interest his countrymen in behalf of his invention. The session of congress of 1842-'3 was memorable in Morse's history, as one of persevering effort on his part, under great disadvantages, to obtain the aid of congress; and his hope had expired on the last evening of the session, when he retired late to bed preparatory to his return home the next day. But in the morning—the morning of March 4, 1843—he was startled with the announcement that the desired aid of congress had been obtained in the midnight hour of the expiring session, and \$30,000 placed at his disposal for his experimental essay between Washington and Baltimore. In 1844 the work was completed, and demonstrated to the world the practicability and the utility of the Morse system of electro-magnetic telegraphs. In the 16 years since its first establishment, its lines have gone throughout North and parts of South America, to the

extent of more than 86,500 miles. The system is adopted in every country of the eastern continent; in Europe, exclusively on all the continental lines, from the extreme Russian north to the Italian and Spanish south; eastward through the Turkish empire; south into Egypt and northern Africa, and through India, Australia, and parts of China. Some estimate of the immense value of Morse's invention to the world may be formed from the fact that the telegraph in France alone, in the first 8 years of its infancy, brought to the public revenue the sum of 6,000,000 francs, while the old system of telegraphs in France on the semaphore principle was an annual expense to that government of 1,100,000 francs. Honors have been showered upon him by European sovereigns and governments. It is doubtful if any American ever before received so many marks of distinction. In 1848 Yale college conferred on him the complimentary degree of LL.D.; and in the same year he received the decoration of the *Nishan Iftihar* in diamonds from the sultan of Turkey. Gold medals of scientific merit were awarded him by the king of Prussia (set in a massive gold snuff box), the king of Württemberg, and the emperor of Austria. From the emperor of the French he received in 1856 the cross of chevalier of the legion of honor; in 1857 from the king of Denmark the cross of knight of the Dannebrog; and in 1858 from the queen of Spain the cross of knight commander of the order of Isabella the Catholic. He is also a member of many European and American scientific and art academies. The latest as well as the most distinguished honor that has been conferred on him is an honorary gratuity bestowed by various European governments, whose representatives met at the instance of the present emperor of the French in Paris, to consider the best means of giving the inventor a collective testimonial. Ten states, namely, France, Russia, Sweden, Belgium, Holland, Austria, Sardinia, Tuscany, the Holy See, and Turkey, were represented; their deliberations at two sessions resulted in a vote of 400,000 francs, as an honorary and personal reward to Mr. Morse for his useful labors. In 1856, the telegraph companies of Great Britain united to give Mr. Morse a banquet in London, at which Mr. William Fothergill Cooke presided; and in Paris, in 1858, another banquet was given him by Americans, numbering more than 100, and representing almost every state in the Union. Submarine telegraphy originated also with Prof. Morse, who laid the first submarine telegraph lines in New York harbor in the autumn of 1842, and received at the time from the American Institute a gold medal for that achievement. In a letter from Mr. Morse to the secretary of the U. S. treasury, dated Aug. 10, 1848, it is believed occurs the first suggestion of the project of the Atlantic telegraph. Professor Morse has his summer residence at Poughkeepsie, on the banks of the Hudson river, and his winter residence in New York city. III. SIDNEY EDWARDS, an American jour-

nalist and geographer, brother of the preceding, born in Charlestown, Mass., Feb. 7, 1794. He was admitted to the freshman class of Yale college in Sept. 1805, when only 11 years of age, and was graduated in 1811. In 1812-'13 he wrote a series of articles for the Boston "Columbian Centinel," illustrating the danger to the American Union from an undue multiplication of new states in the South, and showing that it would give to a sectional minority the control of the government. In 1815, while pursuing his studies at the law school in Litchfield, Conn., Mr. Morse was invited by distinguished orthodox clergymen and laymen in the vicinity of Boston to establish a new weekly newspaper in that city; and after consultation, especially with his father and the late Jeremiah Evarts, he prepared the prospectus of the "Boston Recorder," the prototype of that numerous class of journals now so widely established in America and Europe termed "religious newspapers." Mr. Morse was the sole editor and proprietor of the "Recorder" until its income was more than adequate to the payment of all the mechanical expenses; and when he left it, at the end of 15 months, its circulation was greater, with one or two exceptions, than that of any other Boston newspaper. In 1817 Mr. Morse invented, in connection with his elder brother, and patented the flexible piston pump. In 1820 he produced a 12mo. school geography; and in 1822 an 8vo. geography, which was used as a text book in several American colleges. In May, 1823, in connection with his younger brother Richard C. Morse, he established the "New York Observer," now the oldest weekly newspaper in that city, and the oldest religious newspaper in the state of New York. In 1834 he conceived the idea of a new mode of engraving applicable especially to the production of plates for printing maps in connection with type under the common printing press; and after 5 years of experiment he succeeded in June, 1839, with the aid of his assistant, Mr. Henry A. Munson, in producing by the new art, which he named cerography, map prints that elicited the praises of artists and editors in all parts of the land. One of the first applications of cerography was to the illustration of a school geography written by the inventor, of which more than 100,000 copies were printed and disposed of during the first year. The art of cerography has never been patented, nor has the process been revealed to the public, the inventor regarding it as still imperfect, and capable of great improvement.

MORTALITY, BILLS OF. See **BILLS OF MORTALITY.**

MORTAR, in artillery, a short cannon of large bore made of brass or iron, chambered, and used for throwing shells filled with powder, called bombs. For this purpose it is usually raised at an angle of 45°. It is supposed that the earliest made cannon were of the form now known as mortars; and these were originally used for throwing shot. They are said to have been employed in 1494, when Naples was be-

sieged by Charles VIII., but whether for throwing shells or shot is not known. Cyprian Lucas describes their use for throwing bombs in 1588 at the siege of Wachtendonk in Gelderland by the earl of Mansfeld. As used in the English service, there are 3 sizes of iron and 2 of brass mortars, the former being respectively of 13 inch, 10 inch, and 8 inch bore; and the brass of 5½ and 4½ inch. The 10 inch iron mortars are preferred for almost all service, though those of 13 inches are also much used. For sea service they are made stronger than others of the same bore designed for use on the land. Attempts that have been made by the French and others to introduce them of very large size have proved unsuccessful. One employed at the siege of Antwerp fired only 10 or 12 shots, and with comparatively little effect; and not long after it burst when charged very moderately. One of 86 inches bore, and weighing over 50 tons 18 cwt., was constructed by Mr. Mallet for the British government at an expense of more than £8,000. It was intended to carry a shell which before being filled weighed 26 cwt. 2 qrs. The body of the piece was formed of heavy rings of wrought iron nicely fitted into each other, and all bound down to a solid cast iron breech end by huge ribs or staves of wrought iron. This piece also is regarded as a failure.

MORTAR, in domestic and chemical uses, a utensil in which articles are crushed and ground to powder by the use of the instrument belonging to the mortar called the pestle. Various materials are employed for making mortars, as iron, stone, porcelain, glass, and for those used in chemical operations steel and agate. The last named, by its extreme hardness, cleanliness, and resistance to the action of chemical agents, is admirably adapted for this purpose. The supplies of these come chiefly from Oberstein on the Nahe, where the manufacture of them is largely carried on in numerous mills. The rough agates for this use are found in the mountains near by, and are brought from Brazil and other foreign countries to be converted into this and various other articles. Steel mortars are used for crushing particles of diamonds and other very hard substances, the powder of which is required for analysis or other use. They consist of a flat circular base with a depression in the upper side for receiving a short smoothly turned hollow cylinder of steel, open at both ends. This being set in its place, the particles are introduced, and a tightly fitting piston of steel is driven down upon them with a mallet.

MORTAR, a cement of lime and sand. See LIME.

MORTGAGE (Fr. *mort*, dead, and *gage*, pledge; Lat. *vadium mortuum*). Chancellor Kent defines a mortgage to be "the conveyance of an estate by way of pledge for the security of a debt, to become void on payment of it." The old law writers Glanville and Spelman say that mortgage is so called because, between the time of making the conveyance and the time

appointed for payment of the debt, the creditor by the old law received the rents of the estate to his own use, or that these rents were dead or lost to the mortgagee. Littleton gives another derivation of the word, viz.: "If the feoffor doth not pay the sum due at the day limited, then the land which is put in pledge upon condition for the payment of the money is taken from him, and so dead to him upon condition." This derivation is the one usually adopted; though the former has been sometimes preferred, not only because the idea which it conveys of the mortgage, or *vadium mortuum*, is directly opposed to that of the *vadium vivum*, an old form of security no longer in use, in which the accruing rents were applied to diminish the debt; but also because it illustrates the intention which mortgages were first probably designed to effect. For in the times when the exaction of interest was esteemed usurious and was prohibited by the law, this conditional alienation was devised, not at all with the design of depriving the mortgagee of his property if he failed to repay the money, but that the mortgagee might in the mean time receive the rents to his own use in lieu of what he would otherwise have received as interest.—In reviewing the law of mortgage it will be convenient to examine successively the creation and nature of a mortgage with its incidents; the respective estates of the mortgagee and mortgagee; payment and extinguishment of the mortgage; and finally, the correlative rights of redemption and foreclosure. A mortgage of lands was generally created by a conveyance of lands from a debtor to his creditor, with a condition that if a sum of money were paid on a certain day the conveyance should be void, and the debtor might have his former estate. But a mortgage might also be made by an absolute deed of conveyance and a defeasance back to the grantor. This defeasance was a separate instrument defeating the principal deed by making it void if the condition was performed. This form of mortgage was however liable to accident and abuse, and has been generally disapproved by the courts. The former mode was by far the more usual. The maxims of the common law were strictly applied to this kind of conveyance; and if the money were not paid at the very day specified in the deed, the lands were absolutely forfeited, nor would a subsequent tender of the money avail the debtor. But the mortgaged lands were plainly only intended as security for the payment of the money borrowed; and large estates were sometimes pledged for the payment of small debts. A strict forfeiture in such cases was not only inconsistent with the plain principles of justice, but was contrary to the spirit of the contract. For these reasons the court of chancery interposed, and by an equitable construction mitigated the severity of the common law. (See EQUITY OF REDEMPTION.) Hence the condition in these cases came to be regarded as in the nature of a penalty, against which a just relief should be given. The con-

dition was intended merely as a means of enforcing the performance of the contract, and if this end were substantially attained there could be no right to use these means for an ulterior object prejudicial to the other party. Whenever therefore a failure to pay at the time appointed could be subsequently compensated, the injured party should be compelled to accept this equivalent for his loss. The doctrine finally prevailed, that although the conditions were not strictly performed, yet if the debtor, within a reasonable time, paid the debt with interest, he should be entitled to call on his creditor for a reconveyance of the lands. But on the other hand, chancery gave to the mortgagee, after reasonable indulgence to the mortgageor, the right to call upon the latter for the payment of the debt, or in default thereof to be for ever foreclosed or excluded from any further right of redemption. The right of redemption is considered in equity to be an inseparable incident of every mortgage, and it cannot be abridged by any agreement whatever. From mortgages, however, in respect to restrictions of the equity of redemption, must be distinguished sales with agreements to repurchase, or, as they are usually termed, conditional sales. In their forms, the two transactions are often very similar, and it is difficult to distinguish them. The difference is, that one is only security for a debt, while the other is a regular purchase, for a price paid or to be paid, to become absolute on a particular event. Equity will construe the agreement very strictly, and will pronounce for a mortgage if possible, in order to save the right of redemption; yet if there appear clearly to have been a sale, it will be maintained, and the right of redemption restricted to the time agreed upon.—The solicitude of the court of chancery to protect the rights of the mortgageor must not invade the right of the mortgagee. He has a plain right to his debt or its equivalent value. As a means of securing that, he is often empowered by the mortgage deed to make sale, on a breach of the condition, of the mortgaged premises, pay his debt from the proceeds, and account with the mortgageor for the balance. A power of this kind is now very frequently inserted in mortgage deeds, though it was for a long time seriously questioned and resisted as an infringement of the mortgageor's carefully guarded privilege of redemption. Its validity is now unquestioned. It concerns only the mortgagee's remedy, and under its exercise no right of the mortgageor is either forfeited or sacrificed. In legal phraseology, it is a power coupled with an interest. It is therefore irrevocable, and may be exercised after the death of the mortgageor. It is appendant to the mortgagee's estate, and as part of the mortgage security vests in any person who by assignment or otherwise becomes entitled to the money. In cases free from all doubt it may be exercised, and will be protected if exercised with due caution and in perfectly good faith; but a sale under it will be avoided for the slightest abuse.—The mode of creating a mortgage in

most of the states is to give an obligation for the money due, either by bond or by a promissory note, and a separate deed of conveyance, containing the proviso that if the money be paid on a certain day, then the deed, as also the obligation, shall be void. When, however, as is in some states the case, no separate obligation is given, the question arises whether the mortgagee may have a personal action for the money, or whether his sole remedy is against the land. It is generally construed that the deed is merely evidence of a lien upon the land, but an action will lie for the debt if that be sufficiently admitted in the deed, or even be supported by evidence outside of it. In New York, the creditor's remedy is confined to the land, if the deed contains no express covenant for the payment of the money, and there be no separate agreement to do so. Upon the execution of the deed by which a mortgage is created the legal estate is immediately vested in the mortgagee; and if there be no private agreement or statute provision to the contrary, he may at once enter into the enjoyment of his estate. Technically speaking, the mortgageor is no longer owner and has no right to further possession; and if he do remain, he is in construction of law only a tenant to the mortgagee, and may be ejected at his election even before default of payment. But in view of the intentions which the mortgage is designed to accomplish, the courts have adopted a more equitable doctrine. It cannot be more clearly expressed than in the language of Chief Justice Shaw, who says: "The first great object of the mortgage is, in the form of a conveyance in fee, to give to the mortgagee an effectual security by the pledge of real estate for the payment of his debt or the performance of some other obligation. The next is to leave to the mortgageor, and to purchasers, creditors, and all others claiming derivatively through him, the full and entire control, disposition, and ownership of the estate, subject only to the first purpose, that of securing the mortgagee." Hence it is that as between the mortgageor and mortgagee the mortgage is to be considered a conveyance in fee, because that construction best secures the latter in his remedy and in his ultimate rights to the estate and to the incident rents and profits. But in all other respects until foreclosure, when the mortgagee becomes the absolute owner, the mortgage is deemed to be a lien or charge, subject to which the estate charged may be conveyed, attached, and in other respects dealt with as the estate of the mortgageor; and all statutes upon the subject are to be so construed, and all rules of law whether administered in law or in equity are to be so applied, as to carry these objects into effect. So that until decree of foreclosure, even after default of payment at the time appointed, the mortgageor is the real owner, and his equity of redemption is descendible, devisable, and alienable, just like an absolute estate of inheritance. It is the natural consequence of this view of the mortgageor's estate that the title of the mortgagee should be regarded not

as an estate in lands, but as a mere chattel interest. So long as the mortgageor's right of redemption exists, the mortgage is considered only the personal estate of the mortgagee, and, as such, passes at his death to his executor and not to his heir. Still, though the mortgagee's interest is thus reduced from the dignity of an estate to that of a mere security, he is not divested of his right to the possession subject to the duty of accounting for the rents and profits, and he may, after entry and notice to the mortgageor's tenants, receive the rents himself. In such a case the mortgage is treated as if it had no existence until actually enforced by the mortgagee. So that whether the lease was made prior or subsequent to the mortgage, the tenant must pay his rents to his landlord the mortgageor, until notice or demand by the mortgagee. If the mortgagee enter into actual possession of the estate, he will be held accountable, as bailiff or steward of the mortgageor, for the net rents and profits. These are to be ascertained after deducting from the receipts the cost of ordinary repairs, taxes, and other expenses of this character. The mortgagee will be held to account for the utmost value the estate would have produced with ordinary care. It is the usual custom in this country to allow the mortgagee a reasonable compensation as trustee of the mortgageor for his trouble in managing the estate. The amount of it and other items of allowance are generally prescribed by statute. In conformity with the American principle of giving complete publicity to titles of real property, the mortgagee's rights depend very materially upon the registration of his mortgage. In some of the states the deed is inoperative until recorded, except between the parties and their heirs; and it is the general rule that if not recorded, it is void as against a subsequent purchaser or mortgagee, for valuable consideration, who was without notice of the prior encumbrance, and whose conveyance is first duly recorded. But, in this respect, the particular statutory provisions of each state must be consulted.—The mortgage being regarded both at law and in equity as merely a security for the debt, payment of that relieves the estate of its encumbrance; and the mortgage may also be extinguished by an express release from the mortgagee, as also by a tender and refusal of the money, though the debt remains due. A mere change of the securities, as giving a new note for the old one, so long as the same debt remains, does not discharge the mortgage, though it would be otherwise if the facts of the case disclose the evident intention of the parties that the substitution should operate as payment of the debt. If the mortgageor have died leaving real and personal estate, without charging either with the payment of his debt, his personal estate will be first applied to this purpose, because that is the fund which was increased by the money borrowed. When this fails, the proceeds of lands devised for the payment of debts will be applied. If a wife join with her husband in

a mortgage of her own estate, and the money be used by the husband for his own benefit, it is the wife's right to have his personal estate devoted to the extinguishment of the mortgage.—If the mortgageor remain in possession, payment before breach of the condition will revest the estate in him at once. If the payment be made, though after a breach, it is a good defence to the mortgagee's action at law to recover possession of the estate; and although it has been said that in such a case it is requisite to revest the estate in the mortgageor by a formal reconveyance, the rule of law does not make this necessary. The reason of this, on the best authorities, is, that it is the practice in most of the states to insert in the mortgage deed a proviso that on the payment of the money at a time mentioned, the deed shall be wholly void. Now the time of performance is not of the essence of the contract, but may be waived by parole; and therefore the acceptance of the money after the day amounts to a waiver of the time, and is a substantial performance of the condition.—Many of the state statutes contain explicit provisions respecting the discharge of mortgages upon the record. From the jealous care with which the debtor's rights are protected by the law, no terms made by the mortgagee are suffered to abridge those rights. This disposition of the courts is based upon the rule, which has long prevailed, that what was once a mortgage must always continue to be a mortgage. It has been therefore held that the heir of a mortgageor might redeem, though the right to do so was expressly limited to the lifetime of the mortgageor himself. So an assignee has been permitted to redeem, though it was agreed that only the heirs male of the mortgageor's body should enjoy the right. It has even been said that a condition would be void which provides that if a mortgageor fail to pay on the day fixed, the payment of a further sum by the mortgagee shall render him absolute owner.—All parties legally interested in the estate in privity of title with the mortgageor may have the benefit of his right in order to the enforcement of their claims. Thus his heirs, devisees, assignees, judgment creditors, and remainder men may assert this right. If any one interested will redeem, he must pay the whole debt; if his interest were only partial, he is entitled to contribution from the rest. Whether this right to redeem the land by payment of the debt be subject to execution, has been variously held in different states. At common law it is only a strictly legal estate which can be so levied upon. With an apparent contradiction in terms, this right of redemption has been called the legal estate, and in conformity with this conception of the right, it has been sometimes held at common law to be subject to execution. In almost all the states it has been rendered so by express legislation. The period within which the right of redemption must be exercised is generally fixed by statute.—Foreclosure is the process by which a mortgagee himself acquires, or by sale transfers

to another, an absolute title in property, of which he has until now been only the conditional owner. Various methods of pursuing the remedy are prescribed by state statutes. The process is instituted in some states by bill in chancery calling on the mortgageor presently to redeem or be for ever foreclosed. The court may sometimes order a strict foreclosure, as it is called; the effect of which is to vest the estate absolutely in the mortgagee as purchaser in default of payment. In such a case, the foreclosure has been sometimes regarded as satisfaction of the debt, and the mortgagee's remedy as exhausted. But generally he may have his action at law for the difference between the value of the property and the larger amount of his debt. Usually upon petition the court issues its decree, ordering payment within a fixed time, and on default of it a sale by a master, the satisfaction of the debt, and the payment of the surplus if any to the mortgageor. Another mode of foreclosure is by a sale in virtue of a power to sell contained in the mortgage deed, which has already been considered. A third mode is that by entry; and this may be either peaceably in the presence of witnesses, or under certain forms of law required by statutes. If this process is adopted as preliminary to a strict foreclosure, the mortgageor will be allowed a liberal time after the entry for payment of his debt. The mortgagee may, generally, enforce all his securities until his claim is satisfied, proceeding as well against the person of the mortgageor as against the land.—A glance at equitable mortgages will complete this sketch of the doctrine of mortgages of real property. A legal mortgage, as has been seen, is made by a transfer of the legal estate to the mortgagee by a regular conveyance. In England the deposit of the title deeds of an estate with a creditor will create what is called an equitable mortgage. The deposit, it is said, is evidence of an agreement to give a mortgage, and this is enforced by giving the creditor an equitable lien. This doctrine is however quite foreign to our law. But in the United States as well as in England, the courts recognize what is familiarly known as the vendor's equitable lien for purchase money; that is to say, when an owner of real estate sells and conveys it without receiving payment of the price, he retains a lien upon the property for so much of the money as remains unpaid. The principle is now generally adopted in our law, but has been rejected in several states. Its admission has been contested with the same arguments which were successfully opposed to the doctrine of an equitable mortgage by a deposit of title deeds, namely, its inconsistency with that publicity which is so characteristic a feature of the American law of real property; for such a lien is not within the usual registration acts and need not be recorded. It will not however be permitted to prejudice the rights of creditors holding under a *bona fide* mortgage, grant, or other conveyance from the vendee, nor against

a subsequent purchaser without notice. Other cases of equitable mortgages are those in which absolute conveyances have been made, but mortgage only was intended. So purchasers at a sheriff's sale under contract with the debtor that he may redeem will be regarded in equity only as mortgagees. Yet another equitable mortgage, that by judgment or final decree, is treated in the article *LIEN*.—The doctrine of mortgages of personal property is quite as extensive as that already considered. It will not be possible to enter into its details, but a few observations on some of its prominent principles will conclude our review of the doctrine of mortgage. Many of the rules applicable to mortgages of real property are involved also in those of personal property, but the difference in the subjects introduces some differences into the law. Any personal property, and any profits arising out of personal chattels, may be the subjects of mortgage. But the articles must be such that they are capable of being specifically designated and identified by written description. The mortgagee has the legal title subject to be defeated by redemption; and, unless otherwise agreed, the right to the immediate possession. As between the parties, the mortgage is valid without a change of possession; but as to subsequent purchasers and creditors, the continued possession by the mortgageor is *prima facie* but not conclusive evidence of fraud; the burden of proof rests on the mortgagee to explain the transaction, and it is for the jury to decide upon the facts. The mortgage must be generally recorded upon a public register; but a full actual notice, such a notice, says the court in Massachusetts, as would have been given by the instrument of mortgage, may preclude a subsequent purchaser or creditor from availing himself of the omission of registration. Under the usual statutory provisions the mortgage must be recorded in the town where the mortgageor lives. In these mortgages the property passes so completely to the creditor that, unlike the equity of redemption in mortgages of real property, it cannot be seized on execution or attached as the property of the mortgageor. This rule is however modified by statute in some of the states. As to assignment and extinguishment of the mortgage by payment, the same general principles apply as to mortgages of real property. The same remark may be made of the distinction between mortgages and conditional sales. The legal doctrine respecting the mortgagee's interest being strictly maintained, a failure to pay the debt at the time appointed vests in him an absolute title, unless where the statutes of the state in which the transaction took place provide an equity of redemption. In other cases, however, this right may be given by courts having equitable powers.

MORTIER, ÉDOUARD ADOLPHE CASIMIR JOSEPH, duke of Treviso, a French soldier, born at Cateau Cambrésis in 1768, killed in Paris, July 28, 1835. He enlisted as a volunteer in 1791, was elected captain by his fellow soldiers,

served under Dumouriez, and witnessed the battles of Jemmapes and Neerwinden. Promoted to be adjutant-general for bravery at Hondchoete, in Sept. 1793, he was wounded at Maubeuge, but participated actively in the operations under Jourdan that ended in the victory of Fleurus, June 26, 1794. In 1795 he distinguished himself under Marceau, then again under Jourdan at Altenkirchen, June 4, 1796, and was made brigadier-general. In this capacity he served in 1799 on the Danube, and afterward in Switzerland under Masséna. After the 18th Brumaire, Bonaparte made him commander of the 15th and 16th military districts, sent him to Hanover, which he conquered in 1803, put him at the head of the artillery of the consular guard, and in 1804 chose him one of the 18 marshals of the empire. In 1805 he led a division of the army in the campaign against Austria; subdued Heese-Cassel and Hamburg in 1806; worsted the Swedes in several encounters, and occupied Pomerania with the exception of Stralsund. In 1807 he assisted in the campaign against Prussia, fought at Friedland, and received the title of duke of Treviso. As commander of the 5th corps of the army in Spain, he participated in the siege of Saragossa, won a brilliant victory at Ocaña, Nov. 19, 1809, laid siege to Cadiz, and defeated the Spaniards at Gebora in 1811. In the expedition against Russia in 1812, he commanded the junior imperial guard, and behaved with firmness during the disastrous retreat from Moscow. He figured in nearly all the battles that were fought in 1813; and on March 30, 1814, with the duke of Ragusa, he contributed to the defence of Paris. Having adhered to the Bourbons, he was named peer of France during the first restoration, but joined Napoleon on his return from Elba. On the second restoration, his refusal to sit among the judges of Marshal Ney lost him his peerage. In 1816 he was elected to the chamber of deputies, and 3 years later restored to his seat in the upper chamber; he now voted with the liberal party, and welcomed the revolution of July, 1830. He was ambassador to Russia, and prime minister in 1834, with the portfolio of the war department. He was killed by Fieschi's "infernal machine," while on horseback by the side of Louis Philippe.

MORTIFICATION. See **GANGRENE**.

MORTIMER, ROGER, baron of Wigmore, earl of March, the favorite of Queen Isabella of England, executed at Smithfield, Nov. 29, 1330. He had been convicted of treason in the reign of Edward II. and pardoned; but notwithstanding the king's clemency he took part in the rebellion of the earl of Lancaster, and was made prisoner at Boroughbridge in 1322. His life was again spared, and having escaped from the tower, where he was confined, he went to France and entered the service of Charles of Valois. At Paris in 1325 he met Queen Isabella, who had been sent thither by Edward to negotiate a treaty. Fascinated by his pleasing address, the queen was soon known to be living in guilty

intimacy with the exile, and, having secured the person of her young son, began to mature plans with Mortimer and the other leaders of the barons for getting forcible possession of the kingdom. Mortimer went with her to England in 1326. The insurgents were soon in arms to welcome the invaders; the king was deposed, and his son Edward III. was proclaimed in his stead, and for some years Isabella and her paramour governed the realm in the name of the young prince. A council of regency had been appointed, but Mortimer superseded them all. He procured the death of the dethroned monarch in his prison, and obtained the title of earl of March and valuable confiscated estates. The scandal of his life however was denounced from the pulpit; the nobles wearied of his arrogance, and Edward finally resolved to take the sceptre into his own hands. While the queen and Mortimer were lodged in Nottingham castle during the session of parliament at that town, the king and Lord Montacute with attendants entered by night through a subterranean passage, and, despite the cries of Isabella and the struggles of the guards, carried off the earl. The king summoned a new parliament to meet him at Westminster, and on Nov. 26 Mortimer was condemned by this parliament to be drawn and hanged as a traitor.

MORTMAIN (Fr. *mort*, dead, and *main*, hand; Lat. *mortua manus*). Under the system of feudal tenures, the lords of estates enjoyed certain privileges on the death or change of their vassals. When the tenant died, leaving only an infant heir, the lord resumed the fee and retained it during the heir's minority, in order to maintain, out of its rents and profits, a person capable of rendering the services due for the lands. This was the lord's wardship. Marriage, in the sense of the feudal law, consisted in his right to exact a price for consenting to the marriage of his ward. Relief was another incident of feudal tenure. It was a fine or composition, paid by the heir, for the privilege of succeeding to the estate, which had reverted in the lord on the death of his immediate grantor. These and similar profits accrued to the lords on the death of their feudatories. It is the distinctive quality of a corporation that it never dies, and lands held by such bodies produced none of these feudal fruits; but, in the language of Lord Coke, "the lands were said to come to dead hands as to the lords." The mischief had existed even before the conquest. Within two centuries after it, says Blackstone, the busy acquisition of landed estates, by the ecclesiastical corporations, had diminished perceptibly the feudal services ordained for the defence of the realm; the circulation of property from man to man began to stagnate, and the lords were curtailed of their wardships, reliefs, escheats, and the like fruits of their seigniories. The evil attracted the attention of the legislature, and it began to impose restraints on the capacity of corporations aggregate to acquire lands. The earliest of the laws made with this

intent is contained in Magna Charta. The 36th chapter of that instrument declares that "it shall not be lawful for any one to give his lands to any religious house, and to take the same land again to hold of the same house, &c., upon pain that the gift shall be void and the land shall accrue to the lord of the fee." This act destroyed the power to take by gift; for this mode had been adopted by the ecclesiastics to evade the necessity of asking the king's license, which they must by the existing laws have done if they took the lands by purchase. The religious houses next attempted to accomplish their object by buying lands that were *bona fide* holden of themselves, as lords of the fee, or by taking long leases of the desired estates. This is the origin of those terms for 1,000 years or more, sometimes met with in conveyances. This evasion of forfeiture produced the statute *de religiosis* (7 Edward I.), which provides that "no persons, religious or other whatsoever, should buy or sell any lands or tenements, or under the color of any gift or lease or any other title whatsoever receive the same, or by any other craft shall appropriate lands in any wise to come into mortmain, upon pain of forfeiture, at the election of the lords of the fee." But their shrewd lawyers contrived still to relieve the clergy from the embarrassments of these acts. They observed that the statutes thus far extended only to gifts and conveyances between the parties. They invented now, what afterward became one of the most approved assurances in the English conveyancing, namely, a recovery; that is, feigning title to the land which was intended to be conveyed, they brought an action to recover it. By collusion with the tenant no defence was made, and it was the necessary legal consequence that the land was adjudged to the demandants. This contrivance was defeated by the statute of Westminster the second, 18 Edward I. Incapacitated now to take either by gift, purchase, lease, or recovery, and despairing of holding any legal estate in lands, the ecclesiastics resorted to the distinction, familiar to the Roman law, between the right to the rents and profits of land and the right of property in the land itself. They therefore procured a conveyance to a third person and his heirs, with the understanding that the religious houses and their successors should have the beneficial enjoyment of them. This usufructuary interest, as distinguished from the legal ownership, was denominated the use, and founded the whole doctrine of uses and trusts in the present law. Once more the legislature interposed, and by the statute 15 Richard II. declared that no conveyance of lands or other possessions should be made to the use or profit of any spiritual persons, without the license of the king and the mesne lords, upon pain of forfeiture. It will be seen, that though these statutes of mortmain were generally directed against the ecclesiastical corporations, yet civil corporations were equally capable of the mischiefs which they contemplated. In-

deed, they are within the letter of the acts 7 Edward I. and 15 Richard II. The effect of these statutes was to make all lands conveyed in mortmain forfeitable, if the lords or the king elected. But a waiver of this right of forfeiture was always a sufficient license to corporations to hold lands. In process of time, as the mesne seignories declined, and the rights of intermediate lords could be hardly traced, the license of the king as lord paramount was esteemed sufficient. It was therefore provided by the statute 7 and 8 William III. c. 97, that for the future the crown might, in its discretion, grant a license to take or alien in mortmain, of whomsoever the estates might be holden. The act 9 George II. is now the leading English statute of mortmain. It forbids the gift of money or lands to charitable uses, except by deed operating immediately, and without power of revocation, formally executed and enrolled in chancery at least 6 months before the donor's death. In favor of churches, colleges, and hospitals, some modifications of the statutes have been admitted, but a detail of these is unnecessary.—In the United States, with one exception only, the English mortmain laws have been neither adopted nor recognized. In Pennsylvania they are in force. In that state consequently all dedication of lands to pious uses by deed or will, or grants to other corporations, without statutory license, are void, and subject to forfeiture. These laws apply also to lands held in Pennsylvania by foreign corporations. In the other states the only check to the acquisition of lands by corporate bodies, consists in the special restrictions imposed upon them by their charters of incorporation.

MORTON, JAMES DOUGLAS, earl of, regent of Scotland, born in Dalkeith in 1530, executed in Edinburgh, June 8, 1581. He was a younger son of the great family of Angus, but in 1553 succeeded to the estates and title of his father-in-law, the third earl of Morton. Although a friend to Henry VIII. in his designs upon Scotland, and favorably disposed to the reformation, and even one of the original lords of the congregation in 1557, he took at first no very active part against Queen Mary. In 1561 he became privy councillor, and in the beginning of 1563 was appointed lord high chancellor. In consequence, however, of his participation in the murder of Rizzio, he was compelled to fly to England, but through the agency of Bothwell was shortly after pardoned. Although cognizant of the plot to destroy Darnley, he appears to have had no hand in its execution. After the forced abdication of Mary which followed the death of Darnley, and the coronation of her infant son, Morton was reinstated in his office of lord chancellor. He supported the interests of the earl of Murray, the regent, against those of the queen; and to him is especially due the result of the battle of Langside, in consequence of which Mary determined to fly to England. In the violent contentions which divided Scotland after the assassination of Murray, Morton

became the real head of the Protestant party, and was a prominent leader of that portion of the people who espoused the king's cause as opposed to the queen's. The earl of Mar, who had succeeded the earl of Lennox as regent, having died in Oct. 1572, Morton was elected regent in his stead on Nov. 24. Henceforth he ruled Scotland with great rigor, and thereby rendered himself odious. He resigned Sept. 12, 1577, but soon managed to regain his authority. Through the agency of the new favorite of the king, Capt. Stewart, he was unexpectedly brought to trial for having been engaged in the murder of Darnley. He was found guilty of high treason, and was decapitated by an instrument called the maiden, which he himself is said to have introduced into Scotland.

MORTON, JOHN, one of the signers of the declaration of independence, born in Ridley, Chester (now Delaware) co., Penn., in 1724, died in April, 1777. About 1764 he was elected to the general assembly of Pennsylvania, of which he became a conspicuous member, serving for several sessions as speaker. He was a member of the stamp act congress, which met in New York in 1765. About 1767 he became sheriff of his county, and shortly after was appointed one of the judges of the supreme court of Pennsylvania. In 1774 he was made a delegate to the first congress, and was reelected 4 times in succession. While in that position, he signaled himself by giving the casting vote of Pennsylvania in favor of the declaration of independence, the 4 other delegates present from that state being equally divided as to the measure.

MORTON, NATHANIEL, secretary of Plymouth colony, Mass., born in England in 1612, died in Plymouth, June 28, 1685. He came to America with his father in July, 1623, and in 1645 was appointed clerk or secretary of the colony court, which office he held until his death. His principal work was "New England's Memorial, or a brief Relation of the most remarkable and memorable Passages of the Providence of God, manifested to the Planters in New England," compiled chiefly from the manuscripts of his uncle William Bradford, and the journals of Edward Winslow, and including the period from 1620 to 1646 (1669; 2d ed., 1721; 5th ed., with notes by Judge Davis, 1826; 6th ed., with notes by the Congregational board, 1855). In 1680 he wrote a brief ecclesiastical history of the Plymouth church in the records of the church.

MORTON, SAMUEL GEORGE, M.D., an American physician, born in Philadelphia, Jan. 26, 1799, died there, May 15, 1851. His father, George Morton, was a native of Clonmel, Ireland, but emigrated early in life to America, where he died in 1799, leaving a considerable family, which found a home among the Friends or Quakers of Westchester co., New York, to whom Dr. Morton was indebted for his early education. In 1814 he was sent to Burlington, N. J., to a school under the direction of the society of Friends, where he spent a year. In the summer of 1815, in the 17th year of his age, he

entered as an apprentice in a merchant's counting house, where he found his position very irksome. In the autumn of 1818 he obtained a copy of Dr. Rush's "Introductory Lectures on Medicine," which he read with such delight that he definitively resolved to follow the medical profession. Accordingly, after the necessary studies, he was graduated as M.D. in 1820. In April, 1820, he was elected a member of the academy of natural sciences of Philadelphia. He shortly afterward embarked for Europe, and on Oct. 20 entered the university of Edinburgh, where, having meantime gone through a course of study in Paris, he was graduated in 1823. In June, 1824, he returned to Philadelphia, and established himself as a physician, but his success was not rapid. Meanwhile he contributed many papers, on a wide range of subjects, to the "Transactions" of the academy, the "Medical and Physiological Journal," Silliman's "Journal," and the "Transactions" of the American philosophical society. These papers evinced a gradual tendency to physiological studies, particularly in the department of craniology; he also devoted himself to making a collection of crania. In 1834 he made a voyage to the West Indies, where he studied the diversity of races and the relations resulting from their contact. In Sept. 1839, he was elected professor of anatomy in the Pennsylvania medical college, which position he resigned in 1843. In 1839 he published his large work, "Crania Americana," upon which his scientific reputation mainly rests. This work was founded on his own collection of skulls, laboriously got together, at heavy cost, without aid from government or societies. As far back as 1840 it was by far the largest museum of comparative craniology in existence, embracing, carefully measured and classified, 867 human skulls, from widely separated regions of the earth, 253 crania of mammals, 267 of birds, and 81 of reptiles and fishes, or a total of 1,468 specimens. The sum of his investigations, as bearing specially on the American aborigines or Indians, was embodied in the work referred to ("Crania Americana, or a Comparative View of the Skulls of various Aboriginal Nations of North and South America; to which is prefixed an Essay on the Varieties of the Human Species; illustrated by 78 plates and a colored map," folio, Philadelphia and London, 1839). Prof. Silliman pronounced it "the most important, extensive, and valuable contribution to the natural history of man which has yet appeared on the American continent." This work was followed by another, less voluminous but scarcely less important, entitled "Crania Egyptiaca, or Observations on Egyptian Ethnography, derived from History and the Monuments," with numerous plates and illustrations (4to., 1844). It was based principally on a collection of 98 heads obtained for him by his friend and disciple, George R. Gliddon, from the tombs and catacombs of Egypt. Following close on these more elaborate publications were others less extensive and formal, which embraced con-

clusions rather than demonstrations, on some of the most interesting questions of physiology and ethnology. Among these were "Observations on the Ethnology and Archæology of the American Aborigines" (Silliman's "Journal," vol. ii., 2d series, 1846), and an "Essay on Hybridity in Plants and Animals, considered in reference to the question of the Unity of the Human Species" (*ib.*, vol. iii., 1847). In 1849 he published "An illustrated System of Human Anatomy, Special, General, and Microscopic." Just before the publication of this work, in Dec. 1848, he was attacked by pleuro-pneumonia, from which he recovered with physical powers much impaired. On May 10, 1851, however, his system gave way, and after 5 days spent in arranging his business and family affairs he calmly died.

MORTON, WILLIAM THOMAS GREEN, M.D., an American dentist, one of the claimants of the discovery of anæsthetics, born in Charlton, Mass., Aug. 19, 1819. His youth was passed upon his father's farm. Going to Boston at the age of 17, he spent some months in a large publishing house, and from this time to his majority he alternated between the counter and the school room. With no taste and little talent for trade, his mercantile career was short and disastrous. In 1840 he commenced the study of dentistry in Baltimore, and 18 months afterward established himself as a dentist in Boston. Among other improvements introduced by him was a new kind of solder by which false teeth are fastened to gold plates, preventing galvanic action. In order to render his work complete, it was desirable that the roots of old teeth should be removed; as this was a tedious and very painful operation, few would submit to it, and there seemed little prospect of the success of the invention unless he could devise means to lessen the pain. He tried stimulants, even to intoxication, opium, and magnetism, but in vain; still the idea possessed his mind that there must be something to produce the desired effect, and he gave himself up seriously to its realization. His limited amount of medical knowledge interfering with the prosecution of his investigations, he entered his name as a medical student in Boston in 1844. About this time the idea was suggested to him in a lecture at the college that sulphuric ether might be used to alleviate pain in his operations; he read such books on chemistry as he could procure, and experimented on animals, but as yet with little success. During his attendance at the medical college and hospital he was obliged to devote all his spare time to his operating rooms and dental laboratory, where he displayed great ingenuity in the mechanical details of his profession, and especially in the manufacture of artificial teeth, which he prosecuted successfully on a large scale. From books and from lectures he learned that sulphuric ether could be inhaled in small quantities with some discomfort, but that in large amount it was dangerous. After experiments on himself, and satisfied of its safety, he administered it to a man on Sept. 30, 1846, producing

unconsciousness, during which a firmly rooted bicuspid tooth was painlessly extracted. After numerous other successful experiments, he communicated their result to Dr. J. C. Warren, and at his request administered the ether, at the Massachusetts general hospital, to a man from whose jaw was removed a vascular tumor on Oct. 16, 1846, the patient remaining unconscious during the operation; from this dates the introduction into general surgery of the discovery of ethereal anæsthesia. Like all other great discoveries, however, it met with the bitterest professional opposition; the jealousy of dentists, the fears of physicians, and the scruples of theologians were in many cases arrayed against it, and various persons claimed to have suggested it. In order to protect himself against such opposition, to secure a fair compensation for his expenditure of time and money, and to keep his discovery within the hands of competent persons, Dr. Morton obtained for it a patent, under the name of "letheon," in Nov. 1846, in the United States, and in the following month in England, offering, however, free rights to all charitable institutions in all parts of the country. Notwithstanding his generous offers, government appropriated his discovery to its use without compensation. Upon their first examination of the testimony, some of the Paris academicians at first recognized Dr. Jackson as the discoverer; but the committee of the academy awarded the Monthyon prize of 5,000 francs to be equally divided between him and Dr. Morton. The latter declined to receive this joint award, protested against the decision of the academy, and in 1852 received the large gold medal, the Monthyon prize in medicine and surgery. He underwent an amount of persecution almost unparalleled in the annals of personal enmity, in private and before congress, his business was broken up, and his very house attacked by the sheriff for debts; but his indomitable will and the encouragement of firm and powerful friends enabled him ever to maintain his claims to the discovery. Relying upon the impartiality and generosity of congress for remuneration of his labors, he had presented his first memorial in Dec. 1846, upon which the appointed committee did not report. Strengthened by the testimonial inaugurated by the trustees of the Massachusetts general hospital in 1848, which conceded to him the discovery of the power and safety of ether in producing anæsthesia, he made a second application to congress in Jan. 1849; a committee, composed entirely of physicians, heard the evidence on both sides, and reported that he was entitled to the merit of the discovery; but on account of the press of business toward the close of the session and on the eve of a change in the administration, they deemed it unadvisable to recommend any pecuniary remuneration. Returning from Washington, he made a brief stay in Baltimore, where he received the regular degree of M.D. from Washington university. In Dec. 1851, he made a third and last appeal to

congress, and his memorial was referred to a select committee; the report of the majority, after a most elaborate investigation, awarded the honor of the discovery to Dr. Morton, and in April, 1852, the majority reported a bill appropriating \$100,000 as a national testimonial for his discovery, on the condition that he should surrender his patent to the government; this bill, on account of the excitement attending the then approaching presidential election, was not acted upon, though warmly approved by several members of the cabinet and urged by members of congress; having at last been brought before the senate as an amendment to the army appropriation bill, it was defeated. In 1853 an amendment to the appropriation bill was offered, granting \$100,000 to the discoverer of practical anæsthesia; after a warm debate it passed the senate, 26 to 23, but failed in the house. In 1854 a similar bill was presented by Mr. Everett, which passed the senate by 24 to 13, but was lost in the house. Thus ended a struggle of 8 years spent in vindicating his claims. In 1854 Dr. Morton attempted to obtain from the executive a recognition of the validity of his patent, supported by the recommendation of 150 members of congress that the right to use his discovery be purchased for the public service, or that the government respect its own patent and discontinue its use; after 2 years' delay the president informed him that whenever it was decided in the courts that the government had violated his patent, it would pay. At this defeat his creditors became importunate, and reduced him and his family to utter poverty; but in the winter of 1856-'7 a plan for a national testimonial was instituted in Boston, encouraged by many of the principal physicians and merchants of that city; in their appeal they give to him the credit of presenting to the world the fact that a safe insensibility can be produced by ætheric vapors in the following words: "Nearly the whole of the medical profession of this city, in the midst of whom the discovery was made, together with other bodies of competent persons who have investigated its origin, have, after careful scrutiny, concurred in assigning this merit to Dr. Morton, and public opinion has long since affirmed their verdict." In 1858 a similar appeal was made in New York, signed by the principal medical men of that city, from which the following is an extract: "For this discovery the world is indebted to Dr. William T. G. Morton, of Boston. Whatever may have been the steps preliminary to this remarkable discovery, Dr. Morton's claim to it is established beyond all controversy, and his merit in this respect, with those who have taken the trouble to inform themselves on the subject, can be no longer a question of dispute." In 1860 the medical profession of Philadelphia signed a testimonial of the same character, which says: "We believe the practical originator of anæsthetic inhalation to be Dr. William T. G. Morton, of Boston, Mass. We are convinced that he is the

one who first resorted to ethereal inhalation for the purpose of producing insensibility to pain in a patient while undergoing a surgical operation; and that he is the one who first succeeded in effecting this result. He was, indisputably, the first to urge the anæsthetic properties of the vapor of ether upon the attention of the medical profession, and thus succeeded in establishing the practice of anæsthetic inhalation." In 1858, to save his home from the sheriff's sale for debt, he instituted a suit against a marine hospital surgeon for infringing his patent, as suggested by the president, which was decided in his favor in the U. S. circuit court.—See "Trials of a Public Benefactor," by Dr. Nathan P. Rice (New York, 1859).

MOSAIC (Gr. *μουσαϊκον*, polished, elegant, or well wrought; Lat. *musivum*), the representation of a design by the fitting together on a ground of cement of numerous small pieces of stone and glass, of various colors and generally of a cubical form, as stitches of different colors are used in worsted work. Although one of the most mechanical of the fine arts, it is entitled to rank as a style of painting, from the fact that it requires the preparation of a cartoon or colored design as in the case of a fresco or an elaborate oil picture, and no inconsiderable knowledge of art and the science of form, color, and composition on the part of the artist. Dating from a remote period, it has been transmitted through successive eras and schools to the present time, and in modern Italy has been carried to a higher degree of perfection than it attained at periods when it was almost the only species of pictorial art in vogue. Of the mechanical process, the following description of the practice in the establishment at the Vatican in Rome will convey an adequate idea: "The slab upon which the mosaic is made is generally of Travertine or Tibertine stone. In this the workman cuts a certain space, which he encircles with bands or cramps of iron. Upon this hollowed surface mastic or cementing paste is gradually spread as the progress of the work requires it, thus forming the adhesive ground or bed on which the mosaic is laid. The mastic is composed of calcined marble and finely powdered Travertine stone, mixed to the consistence of paste with linseed oil. Into this paste are stuck the *smalti* or small cubes of colored glass which compose the picture, in the same manner as were the colored glass, stone, and marble *sectilia* and *tessera* of the ancients. The *smalti* are vitrified but opaque, partaking of the nature of stone and glass, or enamels; and are composed of a variety of minerals and materials, colored, for the most part, with different metallic oxides. They are manufactured in Rome in the form of long, slender rods, like wires, of different degrees of thickness, and are cut into pieces of the requisite sizes, from the smallest pin point to an inch. When the mastic has sufficiently indurated (and it acquires in time the hardness of stone), the work is susceptible of a polish like crystal. Care must be taken, how-

ever, that by too high a polish the entire effect of the work is not injured, as innumerable reflected lights in that case would glitter in every part of the picture. When the design is to be seen at a very considerable distance, as in cupolas or flat ceilings, they are generally less elaborately polished, as the inequalities of the surface are the less distinguishable, and the interstices of the work cannot be detected by the spectator." By this process many copies of the large pictures by Raphael, Domenichino, and other old masters in the Vatican have been executed, occupying periods of from 12 to 20 years, and requiring from 10,000 to 15,000 different shades of the primary colors for the purposes of the work. A very splendid specimen, owned by Edward F. Davison of New York, representing the ruins of Paestum, contains over 750,000 pieces of enamel within a space of 5 by 2½ feet, and occupied 5 years in the execution. In 1858 Pope Pius IX. sent to the crystal palace exhibition of New York a mosaic copy of Guercino's "St. John the Baptist," valued at \$60,000, which at a short distance it was impossible to distinguish from a highly finished oil painting. This, however, was a work of small importance in comparison with others preserved in the cathedrals of Europe, in one of which, that of St. Roque in Lisbon, is a chapel dedicated to St. John the Baptist, which contains 8 mosaics estimated to have cost together \$4,000,000. The value in this case was probably greatly enhanced by the employment of precious stones. Two other species of mosaic work are carried on in Tuscany (whence the name, Florentine mosaics), the *pietre dure* and *pietre commesse*, both of which are employed for ornamental purposes, and represent fruit, flowers, birds, &c. The former gives the objects depicted in relief in colored stones. The latter consists of precious stones, as agates, jaspers, lapis lazuli, &c., cut into thin veneer and carefully inlaid.—The employment of mosaics, which have always possessed a certain value, as well from their imperishable nature as from their intrinsic merits as works of art, originated probably among those eastern nations by whom so many of the arts have been transmitted to Europe. The Romans acquired a knowledge of the process from the Greeks, who in turn borrowed it from the Asiatics; and among these three nations it was originally applied as an ornament for pavements, the close imitation of inanimate objects scattered apparently over the floor being the chief aim of the artist. Large historical compositions, of which the mosaic representing the battle of Jesus from the Casa del Fauno in Pompeii affords a felicitous example, succeeded; and under the first Roman emperors the art attained a considerable degree of refinement, though still used chiefly as an adornment for pavements. The Romans made it coextensive with their civilization, and from Britain to the Euphrates remains of ancient Roman mosaics have frequently been exhumed. Of the varieties in use among the an-

cients, the principal were the *pavimenta sectilia*, consisting of floors formed of pieces of stone of different colors, cut geometrically and cemented together; the *pavimenta tessellata*, or floors inlaid with small cubes of stone forming a colored design; the *opus vermiculatum*; and the *opus musivum*, in which colored cubes of clay or glass of every conceivable tint, set up very much as types are by compositors, were employed to produce elaborate finished pictures. The first three were included under the general name *lithostrotum*. With the overthrow of paganism and the establishment of the Christian religion commenced a new and grander era in the history of the art; and mosaics, from being used almost exclusively in pavements, were transferred to the walls and ceilings of sacred edifices. The connecting link between the mosaic pavements of Pompeii and the mosaics of Christian origin is so slight, that Dr. Kugler is "almost tempted to believe that historical mosaic painting of the grander style first started into life in the course of the 4th century, and suddenly took its wide spread." For nearly 1,000 years from this period it was almost exclusively employed for mural decoration, and from its durability, which caused Domenico Ghirlandaio to say that it was the only painting for eternity, has preserved a knowledge of the arts and in some degree of the religious ideas of the middle ages. From the 7th to the 9th century the most important and interesting remains of pictorial art are the mosaics in the churches and the MS. illuminations; and the most ancient representations of the Virgin Mary now remaining are the old mosaics in the churches of Rome, Pisa, and Venice, referred to the latter half of the 5th century.—Christian mosaics admit of two general divisions, the later Roman and the Byzantine styles, the materials in use being in general cubes of colored glass, inlaid, in the Roman school, on a ground of blue or white, and in the Byzantine school on a gold ground, although in the latter the *tessere* are frequently irregular in size and the workmanship coarse. The former style flourished in Italy chiefly in the 5th and 6th centuries, the most splendid specimens of it being found in the churches of Rome and Ravenna. The churches of Sta. Maria Maggiore and of San Vitale in the latter city contain perhaps the finest. When in the 5th century the arts and sciences were driven out of Italy by the distracted state of the country, they found refuge in Byzantium, where about the commencement of the 6th century arose that peculiar style pervading many branches of the fine arts, to which the general name of Byzantine has been applied, and which for 5 succeeding centuries had a predominant influence throughout Europe and among many eastern nations. The first and greatest example of it is the celebrated church of St. Sophia, built by Justinian about the middle of the 6th century, and adorned with an almost incalculable wealth of mosaics, of which only a few colossal seraphim and the

traces of a figure of the Madonna have escaped the effects of Mohammedan fanaticism. By the middle of the 7th century it gained a foothold in Rome, where the native school of mosaics had lapsed into decay; and subsequently it came into competition with the Lombard, Norman-Byzantine, and Romanesque styles, each of which betrays the influence of the parent Byzantine. The mosaics in the church of St. Mark in Venice, executed between the 11th and 14th centuries, are perhaps the purest specimens of the style in Italy. They cover a surface of many thousand square feet of the upper walls, wagon roofs, and cupolas, and are laid upon a gold ground. Others, in a different style, were executed as late as the 16th century, Titian, Tintoretto, and contemporary masters, in some instances furnishing the cartoons, and the whole are fitly described as "a gigantic work, which even all the wealth of Venice spent 6 centuries in patching together." In the 12th century a new or Romanesque style, founded upon Byzantine traditions, arose in Italy; and early in the 13th century the Italians in northern and central Italy, renouncing their dependence on Greek artists, began to execute mosaic work for themselves according to original conceptions of nature. Andrea Tafi, one of the earliest and most famous of the Italian *mosaicists*, produced a figure of the Saviour, 14 feet high, which, Vasari says, spread his fame throughout Italy. Contemporary with and immediately succeeding him were Jacopo da Turrita, the Gaddi, Giotto, and others, of whom the last executed the celebrated *navicella*, now in St. Peter's in Rome. Among the latest of the *mosaicists*, who worked from their own or original designs, were Baldovinetto, Gherardo, and particularly Ghirlandaio, the master of Michel Angelo, and Muziano, who brought the art to great perfection. At the commencement of the 17th century Clement VIII. employed numerous artists to decorate the interior of the dome of St. Peter's with mosaic copies of the works of eminent masters, and each succeeding century has added to the immense wealth in works of art of this description deposited in the church. In the 18th century Peter Paul de Ohristophoris founded a school for mosaic in Rome, where the art is now practised on a grander scale than in any other part of the world. Among eminent modern *mosaicists* are Barbieri, director of the government manufactory, Luigi Moglia, Poggioni, Gabrini, and Boschetti, all of whom live in Rome.

MOSASAURUS, a gigantic fossil reptile, so named by Conybeare from its having been first found on the banks of the river Meuse, near Maestricht in Holland, in the upper cretaceous formations of that district. It was referred to the orders of cetaceans and crocodilians, but A. Camper and Cuvier showed from the teeth and the skeleton that its true place was between the monitors and the iguanian lizards. The bones of the head are like those of monitors; the teeth of the jaws are compressed, sharp-edged, sup-

ported on a socket in a shallow furrow, without true roots; there are teeth also on the pterygoid bones, as in the iguanians; there seem to have been 28 teeth in each jaw, with broad base and slightly curved. The head is elongated, and the mouth wide; the vertebrae concavo-convex, 84 from head to tail, the latter having nearly 100; as the articular processes are absent from the middle of the back, it has been inferred that the body possessed greater flexibility than that of the crocodiles; the tail is compressed laterally, and has strong V-shaped bones below, indicating its use as a powerful swimming organ; the ribs have a single head; the humerus short and thick as in the ichthyosaurus, and the limbs probably flattened into fins as in enaliosaurians. It must have been a very active marine carnivorous animal. The best known species, *M. Camperi* (Conyb.), had a head 4 feet long, while that of the largest living monitor is only 5 inches, and the length of the animal must have been 25 feet. When Maestricht was besieged by the French toward the close of the last century, the artillerymen were ordered not to direct their shot to the part of the city which contained this celebrated specimen; after the capture of the place, these bones were sent to Paris. (See Cuvier's *Ossements fossiles*.) The genus *goosaurus* (Ouv.), found in the calcareous schists of Menheim, came nearer the crocodiles in the pelvis and thigh bones.—See "Proceedings of the Academy of Natural Sciences," pp. 91, 92 (Philadelphia, 1859).

MOSBOURG, COMTE DE. See AGAR, JEAN ANTOINE MICHEL.

MOSCHELES, IENAZ, a German composer and pianist, of Jewish race, born in Prague, Bohemia, May 30, 1794. He was destined for a mercantile career, but at 8 years of age was allowed to receive musical instruction from Dionysius Weber. In 8 years he became a skilful pianist; and at 14 he was introduced at Vienna to Haydn and Beethoven, and by their advice became the pupil of Albrechtsberger, with whom he made rapid progress. As a pianist he also gained so much in facility of execution as to compete with Hummel, then reputed the first performer in Germany. After an extensive continental tour he arrived in 1820 in England, where he resided during the next 26 years. His reputation as a pianist, at first supreme, has yielded to the claims of Thalberg, Liszt, and others; but probably no musician has so greatly influenced the cultivation in England of the classical music of Bach, Mozart, Beethoven, and kindred composers, or so fully developed a taste for pianoforte music and a knowledge of the resources of the instrument. As a performer of the sonatas and concertos of Beethoven he is still without a superior. His compositions for the pianoforte are finished specimens of classical music, and his trios, quintets, &c., for the violin and other instruments, evince great theoretical knowledge. In 1846 he became musical professor in the conservatory of Leipzig, where he now resides.

MOSCHI, an ancient people of Asia, S. of the Caucasus, whose territory at the time of Augustus was divided between Colchia, Iberia, and Armenia, and from whom a mountain range extending from the Caucasus to the Anti-Taurus received the name of Moschic mountains. Their name, in early classical writers, frequently appears coupled with that of the Tibareni, and the two tribes are generally identified with the Meshech and Tubal of Scripture. (See JAPHETH.)

MOSCHUS, a Greek bucolic poet, who lived about the middle of the 8d century B. C. He was a native of Syracuse, and a pupil or imitator of Bion. There are 4 of his idyls and some small fragments of his lost poems still extant, chiefly in the Doric dialect. The best editions are those of Jacobs (Gotha, 1795), Wakefield (London, 1795), and Manso (Leipsic, 1807).

MOSCOW, a city of Russia, in the government of the same name, situated in the centre of the empire, on the rivers Moskva and Yausa, a small stream, in lat. 55° 45' 13" N., long. 37° 38' E., 400 m. by railway S. S. E. from St. Petersburg; pop. of the city in 1856, 368,765; of the government, 1,580,405. Though no longer the sole metropolis, Moscow still shares this dignity with St. Petersburg; it continues to be specially esteemed by the Russians as the place of the coronation of the czars, the favorite residence of many of the nobility, the commercial emporium of central Russia and western Asia, and a principal seat of Russian manufactures. It is the holy or white mother city in the creed of the people, and no czar would dare to omit visiting it at least twice a year, or presenting in the city his eldest son after he has reached majority. No other city in the world presents so picturesque an aspect. The view of its thousand spires, domes, and minarets, with their diversity of form and color, of the fantastic pile of the Kremlin, and of the garden plots and trees intermixed with the houses, presents a strange oriental panorama, while the pagodas, temples, churches, modern palaces and old yellow cottages, Chinese tea houses and French cafés, Turkish bazaars and Russian market places, and the different costumes of the various classes of the population, including Persians, Armenians, Tartars, Circassians, Russians, Poles, and Europeans of all nations, everywhere combine the most striking Asiatic and European characteristics. From the promiscuous mingling in the same locality of palaces and huts, imposing and unassuming places of worship, stately public buildings and modest private residences, Moscow has been fitly described as being at once "beautiful and rich, grotesque and absurd, magnificent and mean." After the conflagration of 1812 a portion of the city was rebuilt in better taste, some of the principal streets were widened, and two concentric circles of boulevards were added; but the greater part of the smaller streets were rebuilt on the old plan, and though Moscow presents now to some extent the improved appearance and attractions of a

modern city, its ancient and unique character has not been essentially changed. The Kremlin, which has been completely repaired since 1812, still rises on an eminence in the heart of the former metropolis, and forms the central nucleus of Moscow. (See KREMLIN.) The emperor Nicholas extended the area of the Kremlin, and spent millions of rubles for its embellishment; nevertheless preserving the original architectural character of the great walls, porticos, staircases, and churches.—The diameter of the city from N. to S. is estimated at 8 m., and its circumference at 28 m. It has been justly called a city of magnificent distances, the lowness of the houses, the enormous width of the principal thoroughfares, the large interior courtyards and spacious market places, the immense space filled by the public edifices, by pleasure grounds, fields, upward of 200 ponds or small lakes, and marshes, all combining to give it a great extent in proportion to its population. The Moskva divides the city into two unequal parts, about $\frac{2}{3}$, including the Kremlin in the centre, occupying the northern, and $\frac{1}{3}$ the southern bank. On the latter are the Sparrow hills, which run nearly E. and W. and include the whole southern portion of the city. Outside of the boulevard are the private residences, and in the outskirts are the cottages of the poor. Moscow is divided into 5 principal quarters: 1, the Kremlin, with the most magnificent churches, palaces, monasteries, the celebrated belfries (see BELL, vol. ii. p. 93), treasury, arsenal, house of the holy synod, and other public buildings and monuments; 2, the Kitai Gorod, or Chinese city, E. of the Kremlin, surrounded by a wall with 12 towers and 5 gates, the centre of trade, containing the Riadi, an open space of ground laid out in narrow streets of shops or booths, and the Gostinnoi Dvor, or great bazaar, the greatest mart after Nijni Novgorod, occupied by merchants trading with Siberia, China, Tartary, and almost all other parts of the world; 3, the Beloi Gorod, or white town, encircling the Kremlin and Chinese city, and bounded by the river and inner boulevard, containing the palace of the governor and the assembly house, many palaces of the nobility, the university, the founding hospital, the post office, a celebrated circus or military riding school (560 feet long and 158 wide, the roof being unsupported except by the outer walls), and the French and imperial theatres; 4, the Zemlianoi Gorod (earthen town), so called from the former earthen rampart, now converted into a boulevard planted with trees, containing the depot of the commissariat, the depot for spirits, the commercial school, the imperial philanthropic society, and academy of medicine and surgery; 5, the suburbs or Slobodi, surrounding the Zemlianoi Gorod, and like that part of the city possessing a great variety of fine mansions and houses, and presenting alternately scenes of bustle and animation and village-like places of rural seclusion. Many of the most celebrated hospitals are scattered over the suburbs, as well as churches and

monasteries.—Moscow has nearly 800 churches, chiefly Greek, beside a great number of chapels and religious houses. There are several places of worship for Roman Catholics, Protestants, and Armenians, and in the Turkish mosque in the vicinity of Tartar street service is held on the Sabbath (Friday) of the Tartar population. The most celebrated cathedrals of Moscow are those of the Assumption, the Archangel, St. Michael, and the Annunciation in the Kremlin, and that of St. Basil in the Krasnoi Ploshtschad or Red place between the walls of the Kremlin and the Kitai Gorod. The Petrovskoi cathedral in the Kitai Gorod consists of 21 places of worship joined together. The church of St. Anne in the Zemlianoi Gorod, which has given its name to a monastery, is a fine Gothic building noted for the elegance of the interior. Among the largest religious establishments are the Donskoi and Seminoff monasteries, which have both the outward appearance of fortresses. The convent of the Dewitshii at the end of the Dewitshiepolie or Maiden's field, an extensive place surrounded by 16 towers, where the czars give public banquets on occasion of their coronation, contains the tombs of many Russian princesses and the miraculous Virgin of Smolensk. The charitable institutions of Moscow are remarkable for their magnitude. Among the principal are the Galitzin hospital, Sheremetoff hospital, St. Catharine's hospital, the military hospital, and above all the great foundling hospital. (See *FOUNDLING HOSPITAL*, vol. vii. p. 638.)—At the head of the educational institutions stands the university, the centennial anniversary of which was celebrated in 1859, and which is attended by about 1,000 students. Dependent on it is the gymnasium of Moscow. The theological academy is the most important in Russia. There are also excellent military, medical, veterinary, and mercantile schools. Seminaries for young ladies are numerous, and the number of common schools is increasing. There are a number of extensive public and private libraries, and of societies for the promotion of letters, art, and science. A literary rivalry exists between the savants and litterateurs of Moscow and St. Petersburg, the Moscovitans looking down on the Petersburgians. Moscow is the focus of Panslavism, and Schafarik calls it the Slavic oak with golden leaves. Intellectual activity has made rapid progress in Moscow, as well as in other parts of Russia, since the promulgation of the decree for the consideration of the abolition of serfdom in the beginning of 1858.—Beside the imperial palaces in the Kremlin are the Petrofskoi palace and gardens outside of the St. Petersburg gate, the principal fashionable resort during the summer season, and the palace of the empress Elizabeth; and among the favorite pleasure grounds are the beautiful gardens of the Kremlin and the Galitzin garden on the Sparrow hills, near which is the villa presented to the empress Maria Alexandrovna by Count Orloff. Moscow is the residence of two archbishops, and of the governor-

general of the province (in 1860, Count Strogonoff).—The most important Russian manufactures of woollen cloths, cotton, silks, carpets, jewelry, paper, &c., are in the government and city of Moscow. Their number exceeds 1,200; they employ upward of 120,000 persons, and the articles produced in the government are valued at \$40,000,000. It is an important centre of the internal trade of the empire, which is facilitated by extensive intercommunication with all the ports and cities, and by the St. Petersburg railway, the receipts of which amounted in 1856 to \$5,000,000; $\frac{1}{4}$ for freight and the rest for passengers. The opening of all the ports of China to the commerce of the world, under the stipulations of the late treaties between that government and the western powers, promises to give a great impulse to the silk and tea trades and to the general commercial activity of Moscow. Beside the Riadi and the great bazaar, there are a great number of other market places. The so called winter market presents a remarkable aspect during the winter, when the fish of the White sea and northern lakes, the frozen oxen from the Crimea, Caspian sheep, and deer from the banks of the Irtysh and Yenisei, are piled together. The horse market of Moscow is of great importance, and the city contains also a race course. Industrial exhibitions often take place in the city.—Moscow is said to have been founded in the middle of the 12th century by George Dolgoruki, prince of Kiev. Ivan Danilovitch of Vladimir took the title of grand prince of Moscow in the early part of the 14th century, and from that time it remained the seat of government until the beginning of the 18th, when the administration was transferred by Peter the Great to St. Petersburg. Moscow was plundered by the Lithuanians and the Tartars of Tamerlane in the latter part of the 14th century, and subjected to many vicissitudes in the 15th and 16th. It was nearly consumed by fire in 1536, in 1547, and again in 1571, when the Tartars set fire to the suburbs, a large part of the population perishing on that occasion. During the insurrections caused by the pseudo-Demetrius (1605–'12), when the Poles and Cossacks took the city, it was again partly destroyed. In 1812 it was entered by the French under Murat on Sept. 14, and on the 15th by Napoleon, who took up his residence in the Terema palace in the Kremlin. The city, deserted by its inhabitants, was set on fire by order of the governor, Count Rostoptschin, compelling Napoleon to leave on Oct. 19, and to take his final departure on the 28d, and resulting in the disastrous retreat of the French army. The greater part of the city was then destroyed, notwithstanding the efforts of the French to stay the progress of the flames. It was rebuilt within a few years, and has since fully recovered from the calamity. The railway to St. Petersburg was opened in 1851. In 1856 Moscow presented a scene of great animation and splendor on occasion of the coronation of the present emperor Alexander II. in

the cathedral of the Assumption (Sept. 7). In Aug. 1860, the emperor visited Moscow in order to introduce the tzarewitch, the grand duke Nicholas, to the ancient capital of the empire.

MOSELLE (Germ. *Mosel*; anc. *Mosella*), an affluent of the Rhine, which rises in France, in the S. E. part of the department of Vosges, and flows nearly N. W. to Toul, in the department of Meurthe; thence its course is N. E. till it is joined by the Meurthe, when turning N. it passes through the department of Moselle, out of France, and for over 20 m. forms the boundary between Rhenish Prussia and Dutch Luxemburg. Its course then again changes to the N. E., and so continues through Rhenish Prussia to Coblenz, where it falls into the Rhine. The Moselle is about 320 m. long, more than 180 m. of which is through France. Its chief tributaries are: on the right, the Vologne, Meurthe, Seille, and Sarre; on the left, the Madon, Math, Orne, and Sure. The principal cities on its banks are Metz, Treves, and Coblenz. It is navigable for over 200 m., or from its junction with the Meurthe to its mouth.

MOSELLE, a N. E. department of France, bounded N. by Belgium, Luxemburg, and Rhenish Prussia, E. by Bavaria, S. by the departments of Bas-Rhin and Meurthe, and W. by that of Meuse; area, 2,078 sq. m.; pop. in 1856, 451,152. The surface is in general uneven, but none of the hills are more than 650 feet high, and they are covered from base to summit with vineyards, fruit trees, or forests. The most important minerals are iron, copper, lead, building stone, gypsum, and potters' earth. Linen, muslin, canvas, woollen and cotton stuffs, &c., are manufactured. Capital, Metz. Chief towns, Thionville, Briey, and Sarreguemines.

MOSELLE WINES are produced in the above described department and in the neighboring districts of Luxemburg, Liège, and Lorraine. They are renowned for their pure taste and fine flavor, but are rather light. Both red and white wines are included under the name.

MOSEN, JULIUS, a German poet, born in Marieney, Saxony, July 8, 1803. His father was a schoolmaster; the son studied jurisprudence at Jena and Leipsic. After filling some inferior judicial stations in the provinces, he removed to Dresden, where he practised his profession. His first poem, *Lied vom Ritter Wasa* (1831), was followed in 1838 by *Ahasver*. His reputation was more firmly established by his *Andreas Hofer* and other poems, which appeared in 1836 under the title of *Gedichte*. He has since published a series of fanciful works (*Novellen*, 1837; *Die Bilder im Moose*, 1846, &c.). He is also known as a dramatist by his *Cola Rienzi*, *Otto III.*, and other tragedies, collected in 1842, and by his more recent plays *Johann von Oestreich*, the comedy entitled *Die Wette*, and other dramatic productions.

MOSER, GEORGE MICHAEL, an English enameller and gold chaser, born in Schaffhausen, Switzerland, in 1704, died in England in 1783. According to Sir Joshua Reynolds, he excelled

in his profession, had a universal knowledge in all branches of painting and sculpture, and "may truly be said in every sense to have been the father of the present race of artists." He was an original member of the royal academy, and for many years keeper of that institution, in which capacity he instructed the students in drawing and modelling from the antique.—**MARY** (LLOYD), daughter of the preceding, died in 1819 at an advanced age. She was distinguished as a flower painter, and was the only woman, with the exception of Angelica Kauffmann, ever a member of the royal academy.

MOSER, JOHANN JAKOB, a German jurist, born in Stuttgart, Jan. 18, 1701, died there, Sept. 30, 1785. He was educated at the university of Tübingen, where at the age of 19 he was appointed teacher, and in 1727 professor of law. In 1736 he was made director of the university of Frankfort-on-the-Oder, but this office he abandoned in 1739. In 1749 he founded at Hanau an academy for the instruction of young nobles in political science. In 1759 he was sentenced to 5 years' imprisonment in the fortress of Hohentwiel for having memorialized the duke on the subject of the rights of the estates. He was the first to give a systematic account of European international law. A catalogue of his works, which number nearly 500, is given by Menzel. His principal work is *Deutsches Staatsrecht* (50 vols., Nuremberg, 1737-'54).—**FRIEDRICH KARL VON**, a German statesman and publicist, son of the preceding, born in Stuttgart, Dec. 18, 1723, died in Ludwigsburg in 1798. He was for many years imperial councillor at the court of Vienna, and afterward a member of the administration of Hesse-Darmstadt. His work entitled *Der Herr und der Diener* (1759), exposing administrative abuses, created a great sensation. Although he was opposed by Lessing and his friends on account of his pietism, this work was warmly defended in Nicolai's "Letters upon Literature," as calculated to promote the political regeneration of the country. Herder, however, says of it: "The minister too obviously dictates, the philosopher has not time enough to digest, and the writer not leisure enough himself to write and to arrange." He exerted a still greater influence by means of the *Patriotisches Archiv*, which he edited from 1784 to 1790, and which for two years was followed by the *Neues Patriotisches Archiv*. He also wrote extensively on public and international laws, and is the author of a *Geschichte der Waldenser* (Zürich, 1798), and of *Luther's Fürsten-Spiegel* (new ed., Frankfort, 1834).

MOSER, JUSTUS, a German statesman and author, born in Osnabrück, Dec. 14, 1720, died there, Jan. 8, 1794. He studied jurisprudence at Jena and Göttingen, and became attorney-general in 1747; and for 20 years during the minority of the duke Frederic of York, who came into possession of Osnabrück in 1763, he was the principal adviser of the regent. From 1762 to 1768 he officiated as a magistrate in the

crininal court, and afterward until his death as one of the superior officers of justice. His services were as disinterested as they were important. In his writings he often presented his ideas in a humorous garb suited to the tastes of the people. One of his most celebrated humorous works is his *Harlekin*, directed against pedants and hypocrites of all kinds. In his work on the German language and literature he attacks the Gallomania and infidelity of Frederic the Great; and in a letter addressed to Jean Jacques Rousseau he opposes the theories of that philosopher. He believed in the necessity of positive religion for the people, and regarded an aristocratic and paternal administration as the best form of government. His most important contribution to literature is his "History of Osnabrück" (3 vols., 1768; 2d and improved ed., 1780; 3d ed., 1820; a 3d vol. published from his literary remains by Herbut von Bar, 1824). His most celebrated short essays, which originally appeared from 1766 to 1782 in the Osnabrück *Intelligenzblätter*, and were afterward published under the title of *Patriotische Phantasien* (Osnabrück, 1775-'86; 3d ed. prepared by his daughter in 4 vols., Berlin, 1804), relate to local subjects, and are to this day calculated to enlighten the mind and improve the character of German officials. A complete edition of his works was published by B. R. Abeken (10 vols., Berlin, 1842-'3).

MOSES. See HEBREWS, vol. ix, pp. 28-30.

MOSHEIM, JOHANN LORENZ VON, a German ecclesiastical historian, born in Lübeck, Oct. 9, 1694, died in Göttingen, Sept. 9, 1755. He was educated at the gymnasium of Lübeck and the university of Kiel, where he became professor of philosophy. In 1725 he accepted the chair of theology in the university of Helmstedt, and remained there till 1747, when he removed to Göttingen, on being appointed divinity professor and chancellor of that university, where he continued till his death. Mosheim was equally eminent as a scholar, lecturer, and preacher. He was the author of over 160 works, the principal of which are: *Institutiones Historiæ Ecclesiasticæ, Antiquioris et Recentioris* (Helmstedt, 1726); and *De Rebus Christianorum ante Constantinum Magnum Commentarii* (Helmstedt, 1758). These works have been translated into German and English. The best English translation is by James Murdock, D.D., "Institutes of Ecclesiastical History" (8 vols. 8vo., New York, 1882; many times reprinted); and "Commentaries on the Affairs of the Christians before Constantine" (2 vols. 8vo., New York, 1855).

MOSKVA, BATTLE OF THE. See BORODINO.

MOSLEM. See MUSSULMAN.

MOSQUE (Arab. *mesjid*, "place of prayer"), a Mohammedan temple or house of worship. The first mosque was erected by Mohammed himself at Medina, part of the work being done by his own hands. The place chosen for the site was a graveyard shaded by date trees, and the prophet was guided in his choice by the

favorable omen of his camel having knelt opposite to this place on his public entry into the city. The edifice was square in form and simple in structure, the walls of earth and brick, and the roof supported by the trunks of palm trees and thatched with palm leaves. It was about 100 ells square, and had 3 doors. A part of the building was assigned as a habitation to the poor among the faithful who had no other homes. In this mosque Mohammed was buried; and though the original edifice was long ago replaced by a larger and more sumptuous structure, the temple still bears the name of *mesjid al nabi*, "the mosque of the prophet," and has ever since served as a model for the construction of Mohammedan places of worship. Everywhere the mosque is substantially the same in plan, though differing in detail in some countries, as modified by national taste. What in Arabia was simple and elegant became highly ornate in Spain, florid in Turkey, and effeminate in India. It was in the reign of the caliph El Walid, toward the end of the 1st century of the Hegira, that the cupola and the minaret were added to the mosque, and the Saracenic style of architecture introduced throughout the Moslem world. The mosque of the prophet at Medina, the great mosque at Mecca, and the mosque of Omar at Jerusalem, are considered peculiarly holy, and are among the finest extant specimens of Moslem architecture. Cairo has nearly 800 mosques, the chief of which, that of Sultan Hassan, is a majestic edifice in the purest style. The Jumna Mesjid or great mosque at Delhi, built by the emperor Shahjehan about the middle of the 17th century, is however generally considered the noblest building ever erected for Mohammedan worship. The principal mosque of Constantinople was originally the Christian church of St. Sophia, built by the emperor Justinian in the 6th century. The mosque of Solymán the Magnificent, begun in 1550 and finished in 1555, surpasses St. Sophia in beauty and in taste. Attached to this mosque, as to almost all others, are various endowments for institutions of education, piety, and benevolence. It has an annual revenue of 300,000 piasters.

MOSQUITO. See GNAT.

MOSQUITO SHORE, MOSQUITO COAST, or MOSQUITIA, a portion of the eastern or Atlantic coast of Central America, usually understood among geographers as embracing the shore of the Caribbean sea, from Cape Gracias á Dios to Bluefields lagoon, between lat. 12° and 16° N., a distance of about 200 m. It has been claimed by the British government, in its capacity of protector of the Mosquito Indians, that it embraces the entire coast line of Central America, between Cape Honduras, near the port of Truxillo, lat. 16° N., long. 86° W., and Boca del Toro in Chiriqui lagoon, lat. 9°, long. 82°, a coast line of about 700 m. This coast was discovered by Columbus on his 4th voyage in 1502, and was described by his companions as a very low land, filled with creeks and la-

goons, and thinly inhabited by Indians of an inferior grade, dark in color, and barbarous in their character and habits. Without precious metals, and holding out small attractions to Spanish enterprise, this shore was allowed to remain unoccupied, while the central portions and the Pacific coast of Central America were rapidly reduced and populated. During the swarming of the buccaneers in the sea of the Antilles, about the middle of the 17th century, they made this coast a principal place of resort, and established relations which afterward served as the basis of the alleged British protectorate. Early in the same century a Guinea slave ship was wrecked on the coast near Cape Gracias; the negroes escaped, and, with the runaway slaves or *cimarrones* from the Spanish settlements in the interior, mingled with the natives, and gave them that peculiar semi-African character which the Spaniards have indicated by the term *Sambos-Mosquitos*. In 1740 the English attempted to occupy the shore in sovereignty; and, through the intervention of a Capt. Robert Hodgson, obtained from some of the chiefs a cession of the territory to the British crown. This act was followed by an actual occupation, which constituted one of the issues between England and Spain in the war which was terminated by the treaty of Paris of 1763, by which Great Britain agreed to evacuate not only the Mosquito shore, but "all other places in the territory of Spain in that part of the world." Owing to alleged infractions of this treaty by Great Britain, its provisions were revised and made more explicit by the subsequent treaty of 1783, which stipulated that all the "English settlements on the Spanish continent" should be abandoned "without exception." But on the ground that the Mosquito shore was not a part of the Spanish but of the American continent, relations were kept up with the coast as before. This led to reclamations on the part of Spain, which were only settled by the supplementary treaty of 1786, which provided that "his Britannic majesty's subjects and other colonists, who have enjoyed the protection of England, shall evacuate the country of the Mosquitos, as well as the continent in general, and the islands adjacent without exception." But soon afterward the stirring events of the French revolution and the great continental war drew the attention of both countries from this coast. A number of the old settlers remained there in spite of the treaties, and were joined by certain traders from Jamaica, who together established very intimate relations with the Mosquitos and their chiefs, to whom they gave sounding titles, such as kings, governors, generals, and admirals; and they even invented "a regalia," described by Macgregor as consisting of "a silver gilt crown, a sword, and a sceptre of moderate value." Finally, one of these "kings" was taken to the British establishment of Balize, and there, on April 23, 1825, formally crowned as king of the Mosquito nation. This king was sent back to the coast, but, having exhibited

some indications of independence, was again taken to Balize, where he died, not however until he had affixed his mark to a document previously prepared, and styled a will, in which he made over his kingdom to Col. Macdonald, superintendent of Balize, as regent. Col. Macdonald at once sent some of his subordinates to the coast, who were soon after recognized by the British government as acting in its name; and thus originated the English protectorate over the coast. In 1848 an attempt was made to extend this protectorate not only over the greater part of the Atlantic shore of the country, but inland so as to include fully one half of the states of Honduras, Nicaragua, and Costa Rica. Under pretence that it fell within the territory of the so called Mosquito king (an Indian boy living in the house of the British agent), an English naval force, in Jan. 1848, seized the Nicaraguan port of San Juan at the mouth of the river of the same name. As this port was understood to be the only possible Atlantic terminus for the proposed interoceanic canal through Nicaragua, and as its seizure followed close on the acquisition of California by the United States, which gave the question of communication between the seas for the first time a practical value, the attention of the world became suddenly and strongly directed to the British proceedings on the Mosquito shore. The United States sided openly with the Central American republics in denying the claims of nationality set up on behalf of the Mosquito Indians, and equally the validity of the alleged English protectorate. A diplomatic quarrel was at once raised between the two countries. The *de facto* occupation of the port of San Juan, however, by Americans engaged in opening an interoceanic transit, tended greatly to the settlement of the dispute; and a convention between Great Britain and the United States was proclaimed, July 4, 1850, known as the Clayton-Bulwer convention, in which both parties bind themselves not "to occupy, fortify, colonize, or exercise dominion over the Mosquito shore or any part of Central America." A convention was subsequently agreed upon, in 1856, between Lord Clarendon and the U. S. minister in London, according to which, in Dec. 1859, Great Britain concluded a convention with Honduras for the relinquishment of the Mosquito claims over the territory N. of the river Wanka, with the sole condition of an annuity of \$5,000 a year, for 10 years, to such Mosquito Indians as may be found in the district thus surrendered; and a similar arrangement has been proposed with Nicaragua.—The Mosquitos now retain little pure aboriginal blood, being for the most part mixed Indian and negro. They exist only on the sea coast, or on the creeks and lagoons near the sea, and are fishers rather than hunters or agriculturists. The Vallente, Rama, Cookra, Woolwa, Tongla, and Poyas Indians, who inhabit the interior of the country, although sometimes claimed as Mosquitos, are in fact independent tribes, distinct

in language and habits, and generally hostile to the Mosquitos. The same is true of the Caribs on the sea coast of Honduras. Exclusive of these tribes, the population of the shore does not exceed 1,000 or 1,500. The Mosquitos produce a little tortoise shell and sarsaparilla. They are without any form of religion, but believe in a certain spirit of the water called Lowire, and an evil spirit named Wulasha, who consumes the bodies of the dead. They have great faith in their *sukias* or sorcerers. They are expert in managing their *pitpans* or canoes, and dexterous with the spear, with which they strike fish and capture turtles. Marriage is a rite unknown, and universal licentiousness has produced diseases among them which, with drunkenness, are rapidly reducing their numbers. Their language is peculiar.—The geography of the Mosquito shore is imperfectly known. It is low, and traversed in every direction by lagoons, which receive the rivers descending from the interior, and frequently overflow and unite with each other, so as to permit inland navigation for a distance of 200 m. along the coast. Back of the lagoon region there are extensive tracts of open savanna, well adapted for the raising of cattle. There are also broad, sandy plains, covered with large pines; and the banks of the rivers are generally lined with mahogany, rosewood, caoutchouc, and other valuable trees. The shore has several very good harbors, and positions capable of easy settlement. The most important of these is Bluefields lagoon, which derives its name from a Dutch pirate, Blauvelt, who established himself there early in the 17th century. It is a considerable body of water, between 80 and 40 m. in length, and completely landlocked. The great river Escondido, rising in the distant departments of Nicaragua, flows into it. On the S. bank of that river is situated the town of Bluefields (pop. 500, including 50 whites), the residence of the Mosquito king. N. of this lagoon 30 m. is Pearl Cay lagoon, of nearly equal size, which receives the waters of the large river Wawashaan. Among the other rivers, the Prinzapulka, Tongla, Brackma, Wava, and Duckwara are the largest. They all have their sources in the mountains of Nicaragua, and until they reach the vicinity of the coast are violent and rapid. Their lower waters abound in the manatee or sea cow. The climate of the shore is moist and hot, but compares favorably in respect of salubrity with the West India islands generally. The greater part of the soil is fertile.—See Squier, "States of Central America;" "Waikna, or Adventures on the Mosquito Shore;" Roberts, "Voyages and Excursions on the East Coast of Central America;" Strangeway, "Sketch of the Mosquito Shore," &c.

MOSESSES (*musci*), a large family of cryptogamic plants, having distinct stems, leaves, flower-like reproductive organs, and seed-like bodies, which serve to propagate the species. They are cellular in structure, and bear only a faint resemblance to the higher orders of plants. The

stem of the mosses consists of cells of different forms and sizes, as may be readily seen by a transverse section, where those of the circumference are smaller and polyhedral, while those of the centre are elongated and by a closer arrangement approximate toward a woody texture. The stem, when it rises upward and ends in the organs of reproduction, is said to be determinate, and such a moss is acrocarpous; but when it extends lengthwise and laterally in an indefinite manner, it is said to be indeterminate, and the moss is pleurocarpous, because the reproductive organs are borne upon the side branches. The leaves of mosses usually clothe the stem; but in some species the lower part is bare, or at least only covered with a few leaf-like scales. There are two distinct kinds of leaves: 1, those which grow upon the stem, and are called caulinary; 2, those which surround the reproductive organs, and are called perichætal. These latter are more closely set than are the others, forming a sort of rosette in the centre of which the reproductive organs are lodged. The leaves of mosses are very simple, and usually consist of a single cellular layer. They easily imbibe moisture, and as suddenly wither. A passing shower will revive the mosses which grow upon the driest rocks, and thus delight the eye with their verdure. The cells of the leaves are comparatively large, but the size differs greatly in different species. Each cell usually contains chlorophyl, though the cells of the *sphagnum* appear to be destitute of this principle. The cells are uniform in size and general shape, excepting those toward the central portion of the leaf, where they assume an elongated form and constitute themselves into a sort of rib, nerve, or vein, which either bifurcates at the base and shortly ceases, or is produced into a single nerve and continues through the greater length of the leaf, or even extends beyond the apex and ends in a sort of point. The cells upon the edges of the leaf are sometimes modified into a border or into serrated processes like teeth. Sometimes several laminae are produced along the midrib or nerve of the leaf, and sometimes granules or bulbules are produced there. Buds or innovations are also to be met with sometimes in the axils, which when separated can become new plants. With regard to the stem, the phyllotaxis or position of the leaves is $\frac{1}{2}$, $\frac{2}{3}$, or $\frac{3}{4}$. Another modification of the leaves is into a sort of covering situated inside of the perichætal leaves, and consisting of 3 to 6 small leaflets closely adhering together and called the perigone.—The floral or reproductive organs are: 1. The *antheridia*, consisting of cylindrical, pear-shaped, or ellipsoidal stalked sacs containing minute cells of $\frac{1}{16}$ of an inch diameter, in each of which a spiral phytozoon is seen. The antheridia dehisce by irregular openings at their apices, and discharge their contents. Accompanying these are attenuated and abortive organs called *paraphyses*. 2. The *archegonia*, often mixed with paraphyses, arise also from similar small clusters or rosettes of leaves,

and appear in the form of spherical or obovate bodies having an outer envelope (*epigone*) and a central cellular nucleus. They are somewhat longer and considerably more slender than the antheridia, and are filiform except toward the base, where they are tumid, and at the apex, where they are slightly expanded. In the process of growth the central portion increases and rises upward, and at the same time the epigone is ruptured near the base, one portion of it remaining below in the form of a small sheath (*vaginula*), the other being carried up on the fruit-bearing stalk and converted into the *calyptra*. In general, a single archegonium only becomes perfect and undergoes these changes, the rest being found in an abortive state. These two distinct kinds of floral organs sometimes exist in the same flower and are enclosed in the same perichæstium, when the moss is called syncocious; if, however, the antheridia occur on one part of the plant and the archegonia on another part, the moss is called monocious; and when each kind of organ occurs on separate plants, the moss is dioecious. The importance of these differences in the mosses is apparent from the fact that some species produce in some countries only barren flowers or antheridia, and consequently can never be found there in fruit, a condition always desirable to those who collect for herbariums. It has been well ascertained that where the antheridia are wanting the archegonia never come to perfection; and there are some dioecious species of *hypnum* for instance, which are usually destitute of capsules from that cause.—Having noticed the changes which take place in the archegonia as they proceed in their development, the structure of the antheridium and its probable function should be regarded. The structure of the contents of the antheridium is indeed very curious, and was first well observed by Unger. In the *ephagnum*, at the period of inflorescence, this anther-like organ bursts at its apex, when it is found to be filled with minute bodies (*spermatozoides*, Schimper), consisting at first of hemispherical cellulæ containing each a phytozoon, as before noticed. This takes the form of a spirally coiled fibre of one turn and a half attached to one end of an opaque greenish corpuscle. When immersed in water, as on the slide of the microscope, the corpuscle and fibre exhibit a great variety of movements. The function of the phytozoon is regarded as belonging to impregnation. This having taken place, the future fruit is the next effort. The separation of the epigone into *vaginula* and *calyptra* implies generally the lengthening of the intermediate portion, which thus becomes the *seta* or footstalk of the capsule. That portion which is carried upward and is under the *calyptra* is termed the *sporangium*. At first the sporangium is no more than a mass of cellular tissue, the cells of which are homogeneous and contain green matter. When mature it is an urn-like body, with a cellular, central axis called the *columella*, containing spores. In some instances

the sporangium is indehiscent (*e. g.*, *phascum*); in other cases it opens either by 4 lateral valves (*andrea*) or by means of a lid (*operculum*). This lid is thrown off when the sporangium is mature. Between the base of the lid and the edge of the mouth of the capsule or sporangium are frequently several rows of large cells forming a sort of ring (*annulus*), which distend themselves and assist in the dispersion of the spores. The edge of the mouth of the capsule in some mosses is entire (*e. g.*, *gymnostomum*), or it has a fringe (*peristome*) consisting of prolongations and divisions of the two inner parietal layers of the capsule. The peristome consists of one or more rows of hygrometric cellular teeth, which are 4 or some multiple of that number. Where but a single row exists, the mosses are classed as *aploperistomi*, and as *diploperistomi* where there are double rows. The teeth are long and twisted together in *barbula*, or bifurcate in *dicranum*, or assume a variety of shapes, marking the different genera. In some mosses the inner parietal layer appears as a membrane called the epiphragm or tympanum, stretched across the mouth from the walls of the sporangium to the columella. The capsule does not always rest in a perpendicular manner upon the seta, but may be inclined to one side, and bent downward or cernuous; and in some mosses one side of it is more developed than the other, producing an unsymmetrical shape. Sometimes there is a considerable thickening or swelling at its base, to which the name of *apophysis* is given. The interior of the mature capsule is filled with a profusion of dust, which however will be found to consist of round bodies, which are in fact the spores or seeds. When they have been ejected from the capsule, they are in a condition to grow. From some part of their surface a bladder-like swelling protrudes, which after a while extends itself by increase of similar ones into a confervoid thread. An entangled mass of such threads soon covers the soil, or the moist surfaces of substances on which the spores have fallen. So much do these threads resemble some of the algae, that they were mistaken for them by the earlier botanists. This confervoid vegetation continues from 5 to 20 days, when upon its surface very small buds appear. On examination these buds will be found to be composed of minute scaly leaves; and thus the axis or future stem is originated at their base. In some genera the moss scarcely develops itself beyond this condition, forming its fruit in the interior of the scale-like foliage. In other kinds of mosses the plants grow for a shorter or longer period of time before the inflorescence appears. These confervoid threads have been compared to the primordial leaves of the higher orders of plants; they differ however in this, that on disappearing from the surface of the soil, similar threads penetrate it and seem to careless observers to be the roots. In many mosses such seeming roots are pushed from the under side of the stem, or even from the very extremities, in the progress of its growth.

—Very little is known of the uses of the mosses. In the economy of nature they serve as precursors of the higher plants, appearing first upon sterile places, and collecting among their matted and tufted stems the dust and sand. In winter they afford secure lodging places for insects, as well as food for them in summer. Some species of *sphagnum* seem to enter largely into the formation of peat bogs, growing in stagnant pools and ditches, and attaining to great length of stems. When taken from the water and thoroughly squeezed, the *sphagna* serve an excellent purpose for the transmission of trees and large plants by packing their roots in the spongy and elastic mass. Some *hypna* retain their elasticity on being dried, and serve for stuffing pillows. The Laplanders use turfs of *polytricha* for mattresses. Little brooms are sometimes made of these mosses. In dense forests the northern side of trees is usually more thickly covered with mosses than the other sides. Some fanciful medicinal qualities are attributed to a few kinds.—The geographical distribution of the mosses is very extensive. Scarcely any part of the earth's surface is destitute of them, from the polar regions to the equator. They constitute with lichens almost the only vegetation on the coast of the Polar sea, where the soil never thaws to a depth of more than a few inches. The northern sea coast of Siberia is an immense morass whose entire surface is covered with mosses. The schistose rocks of Spitzbergen, rising above the everlasting ice, are, according to Martens, covered with these plants. They enter largely into the flora of Greenland; the loftiest Swiss Alps, and the volcanic scorias of Iceland, afford abundant species. Montagne in his *Sylloge* exhibits species from almost every portion of the globe, and the various exploring expeditions find these forms of vegetation wherever they have visited.—The earliest writer on the mosses who comprehended their structure was Michell, who in 1729 described and depicted the most minute portions of their reproductive organs, and seems to have understood their purposes. On the other hand, Dillenius (1741), Linnæus (1753), and Adanson (1763) regarded the sporangium as analogous to the anther of the phanogamous plants. Schmiedel in 1760, and subsequently in his *Icones Plantarum et Analyses Partium* (1762-'97), described and figured the *soothecca* of the *hepaticas*; and, struck with finding them filled with a mucilaginous fluid analogous to that which fills the pollen grains, he considered them as male organs, and gave the name of female organs to the sporangia of mosses. Hedwig (*Theoria Generationis*, 1784) and other botanists now adopted the same view, until H. Mohl in 1833 showed that the spores of the *hepaticas* and mosses were developed exactly like the pollen grains, and that the ideas of Linnæus and others of that school were in a measure correct. We have seen, however, that the antheridia with their enclosed phytozoa seem to be essential in the production of the sporangium and its contents, though in what way is

not precisely known. In the United States the mosses were perhaps first collected by the celebrated Dr. Muhlenberg, a minister of the German church at Lancaster, Penn. He sent many American species to Hedwig, and they were described and published in the *Species Muscorum* (Leipsic, 1801). In 1818 Muhlenberg's *Catalogus Plantarum America Septentrionalis* (Lancaster) appeared, in which he gives the names of more than 170 species. The value of this list is apparent, when it is known that his correspondence abroad was extensive and highly prized. Many of the species in Bridel's *Bryologia Universa* (Leipzig, 1826) were from contributions of Dr. Torrey of New York, who at that time had made ample collections of cryptogamic plants; and mention is frequently made by the same author of the names of Cooley and Dewey, who likewise furnished specimens. Those of Newfoundland had been collected by De la Pylaie. A synoptical table of the ferns and mosses of the United States was published in 1828 in Silliman's "American Journal of Science and Art," vol. xv., by Dr. Lewis C. Beck. A list of the mosses of Massachusetts is appended to the 2d edition of Prof. Hitchcock's "Geological Report" of that state. The mosses of the British possessions in North America were collected by Drummond, the celebrated author of *Musci Scotici*, who accompanied Franklin in his 2d land expedition in 1825. These subsequently appeared in sets of mounted specimens published by William Wilson at Glasgow in 1828; they were choice and valuable. In the Boston "Journal of Natural History" for 1845 (vol. v.), is a paper by John L. Russell on some species noticed by him in eastern Massachusetts; and in Hovey's "Magazine of Horticulture and Botany" for 1847, vol. xiii., is a valuable list of White mountain species prepared by William Oakes, who had made that region of New England his especial study. In the catalogue of the plants of Cincinnati, Ohio, by the late Thomas G. Lea, are more than 80 species collected by him. In Agassiz's "Lake Superior, its Physical Character, Vegetation," &c. (Boston, 1850), the mosses of that region are elaborated by Lesquereux. Dr. Darlington, in the 2d edition of his *Flora Cestricea* (Philadelphia, 1853), furnishes a list of species detected within the limits of Chester co., Penn., and prepared by Thomas P. James, Esq. The *Musci Alleghanienses* were issued from Columbus, O., in 1855, in 2 4to. fascicles, consisting of 215 species and well marked varieties of mosses, and 177 species of *hepaticas*. Fifty copies only of this superb work were printed for private distribution among the friends of the author. These specimens were collected by William S. Sullivant, Esq., and Prof. Asa Gray, in a tour along the Alleghany mountains from Maryland to Georgia in 1853. A similar work from the joint studies of Lesquereux and Sullivant, consisting of 855 mounted specimens, and entitled *Musci Boreali-Americani* (Columbus, O., 1856), full of rich and well fruited species, and thus giving a view of the muscology of

North America, furnishes the student in this department of botany ample materials for comparison. In the 2d edition of Prof. Asa Gray's "Manual of the Botany of the Northern United States" (New York, 1856) can be found good descriptions of all the species known eastward of the Mississippi river, derived from the most careful study of the ample materials at the command of these botanists. A description of the mosses and liverworts found on the United States Pacific railroad expeditions and surveys, with figures of the rarer and new species by Mr. Sullivan, can be found in the 4th volume of the executive documents (senate) of the 38d congress, 2d session (Washington, 1856). Other valuable contributions in this branch of botany from the same pen are to be seen in the "Memoirs of the American Academy of Arts and Sciences" (Boston, 1848, &c.). The species found in Wisconsin are given by I. A. Lapham, Esq., in the 5th volume of the "Transactions of the Wisconsin State Agricultural Society" (1860). Many novelties likewise have been brought to notice through the labors of O. C. Frost of Brattleborough, Vt., and by Prof. D. C. Eaton of New Haven, who have minutely examined that region. The southern species have received the attention of botanists, and approximations to tropical forms have been detected.

MOSS TROOPERS, a species of banditti or freebooters who formerly infested the borders of England and Scotland, and were so called from the character of the country, composed largely of mosses or morasses. After the union of the two crowns they gradually disappeared, and for upward of 150 years have been extinct.

MOSUL, or **MOUSSUL**, a town of Asiatic Turkey, in the province of Al Jezirah or Mesopotamia, on the right bank of the Tigris, 220 m. N. N. W. from Bagdad; pop. about 35,000, of whom 9,000 are Christians, 1,500 Jews, and the rest Arabs, Turks, and Koords. It is the capital of an eyalet of its own name. Its fortifications are in a very dilapidated condition. The streets are narrow and irregular; the houses, mostly of stone or brick, have commonly vaulted roofs surrounded by flat terraces. Coarse cottons and shawls are manufactured. Mosul was once famous for the manufacture of muslin, which is said to have derived its name from this town. In the vicinity are several hot sulphur springs which are much frequented. Mosul is chiefly interesting as being near the site of Nineveh, whose remains exist in great mounds on the opposite side of the river, excavated by Botta and Layard.

MOTAGUA, RIO. See **GUATEMALA**, vol. viii. p. 539.

MOTET (It. *mottetto*), an elaborate vocal composition, consisting of from 1 to 8 parts, and generally of a sacred character. The Latin psalms and hymns of the Roman Catholic church are frequently so called, and in general the term may be applied to any sacred vocal composition which does not come under the character of a mass or anthem.

MOTH (*phalena*, Linn.), the common name of the 3d and last section of the order *lepidoptera*, the other two having been described under **BUTTERFLY** and **HAWK MOTH**. This section includes a great number of nocturnal insects, also called night butterflies and millers, including all that cannot be arranged under the other sections, whatever be their food or the ways in which they are beneficial or injurious to man. They vary greatly in size, color, and form; while those with gilded wings are very minute, the atlas moth of China (*attacus atlas*) covers a space 9 by 5½ inches with its expanded wings, and the owl moth of Brazil (*erabus stris*) expands 11 inches. The antennæ are usually tapering, either naked or feathered, varying according to sex, and amplex in the males; the wings are bridled by bristles and hooks, the first pair covering the posterior, and more or less sloping when at rest; some females have very small wings or none at all; the hind legs have 2 pairs of spurs. The tongue in most consists of a sucking tube formed of 2 hollow threads, rolled up when not in use; in some it is very short or wanting; there are generally 2 feelers, curving upward from the lower lip. The legs in the larvæ vary from 10 to 16; some in this condition are smooth and naked, others hairy uniformly or in tufts, others warty or spiny; some enclose themselves in silken cocoons (as the silkworm), others enter the ground, or undergo their change in the interior of plants; the chrysalides are of an oval shape, without angular elevations. Most moths conceal themselves by day in cracks and dark places, under leaves, stones, &c., flying only at night and during the warm season; a few, however, as some *bombyces*, fly by day and in the brightest sunlight. Modern entomologists generally recognize 7 groups of moths, as follows: I. *Bombyces* or spinners, including Latreille's 4 sections of *hepialites*, *bombycites*, *pseudo-bombyces*, and *apocura*. This, the largest group, was so named from *bombyx*, the old name of the silkworm, and its members are generally thick-bodied, with feathered antennæ (at least in the males), very short or no feelers, with woolly thorax, and the fore legs often hairy; the caterpillars have 16 legs, and in most cases spin cocoons in which metamorphosis takes place. After Boisduval, Dr. Harris divides this group into 9 families: 1. *Lithosiada*, so called from their caterpillars living in stony places and often feeding on the lichens growing upon rocks; many of the species are very handsome, but injurious from devouring grass; they are of small size, slender bodied, with long bristly antennæ, narrow fore wings, and smooth back; they often fly in the daytime; their caterpillars are sparingly clothed with hairs growing in clusters from small warts, and enclose themselves in cocoons of silk interwoven with their own hairs; the rings of the chrysalides are closely joined. The most elegant species is the *detopsea bella*, with white body, thorax dotted with black, fore wings deep yellow crossed by about 6 black-

dotted white bands, the hind wings scarlet bordered with black behind, and a spread of about $1\frac{1}{2}$ inches; it can hardly be called injurious to vegetation. 2. *Arctiada*, tiger and ermine moths, called woolly bears from the thick hairy covering of most of their caterpillars; the tongue is generally very short, and the antennæ doubly feathered on the under side, hardly visible in the females; feelers shorter and thicker than in the preceding family; wings roofed on each side, thorax thick, abdomen short and plump, generally with black spots; they fly only at night; the hairy caterpillars run very fast, and when irritated roll themselves into a ball; some, like the salt-marsh caterpillar and the yellow bear, are very injurious to vegetation; when about to change they creep into a protected place, and make a cocoon of their own hairs and a little silk; the chrysalis is smooth, with movable joints. Most of our tiger and ermine moths belong to the genus *arctia* (Schr.). The largest is the *A. virgo*, which gives out a very disagreeable odor; it expands $2\frac{1}{2}$ inches, and the wings are reddish; the larva is brown. The great American tiger moth (*A. Americana*), represented in Europe by the *A. carya*, expands $2\frac{1}{2}$ inches; the fore wings are brown marked with white, and the hind ochre yellow spotted with blue black, and with a white edge of the collar; the caterpillar is blackish brown. The yellow bear (*A. Virginica*) is very common and destructive in gardens, devouring almost all kinds of plants; the moth is called the white miller, and would be called an ermine moth in England. The salt-marsh caterpillar (*A. aceræ*) is a great pest to the salt hay crop; it appears toward the end of June, attaining the full size during August, then measuring nearly 2 inches in length. The Isabella tiger moth (*A. Isabella*) is remarkable for the stiffness and evenness of its hairy covering, black toward the head and tail and tan-red between, with black body and head; the moth is tawny yellow with black dots, and the antennæ are not feathered. Some arctians devour the leaves of trees, the most familiar and destructive of which are the fall web worms (*A. textor*), whose large webs so often disfigure our fruit and ornamental trees toward the end of summer; the brood make a web in common, sometimes extending over entire branches, and feed in company under its protection, devouring the upper and pulpy portion of the leaves; when full grown they are a little more than an inch long, and are thinly clothed with hairs; the general color is greenish yellow dotted with black, the head and feet black; the moths are white, with tawny yellow fore thighs and blackish feet; the wings expand about $1\frac{1}{2}$ inches. For full descriptions of these and other arctians, see Dr. Harris's work on the "Insects Injurious to Vegetation." 3. *Liparida*, so called from the thickness of the body of the females, which are sometimes destitute of wings, while the slender males have broad wings; the antennæ are bowed and doubly feathered below; the feelers are very hairy, as are the fore legs; the males some-

times fly by day. The caterpillars are in most half naked, the thin hairs growing chiefly on the sides; they are called tussocks in England, and have sometimes proved so destructive there that prayers were offered in the churches to stay their ravages; they are far less common and injurious in this country, where they are called vaporers moths; they belong to the genus *orgyia*, among others. 4. *Lasiocampada*, with very thick woolly bodies, without the usual bristles or hooks to the wings, with the front edge of the hind wings turned up; the larvæ are generally not warty, and are sparingly clothed with short soft hairs, mostly on the sides; both sexes are winged, and fly only at night. Here belong the tent or lackey caterpillars so common in neglected orchards; the eggs are placed as little cylinders around the ends of branches, and the larvæ when hatched make a tent like a spider's web between the forks of the branches of apple and cherry trees; they make this in common, and remain under it except when eating; they spin from the mouth a silken thread which serves to conduct them to the tent in their search for food, and their pathways become in time well carpeted and secure from this cause. They are called lackeys in England, and *liérées* in France, from their parti-colored livery of white, black, and yellow. The American tent caterpillar or lackey (*clisiocampa Americana*) is so abundant and so well known as one of the worst enemies in the orchard, as to receive in many districts the name of "the caterpillar." The lappet moths are so called from the hairs which grow from fleshy or warty appendages that hang like legs from the sides of every ring; the American lappet moth is the *gastropacha Americana*, described in Dr. Harris's work above cited. The Chinese silkworm (*bombyx mori*), which belongs here, will be noticed under SILKWORM. The processionary moth (*B. processionea*) is remarkable for the singular manner in which the caterpillars march, alluded to under CATERPILLAR. 5. *Saturniada*, containing some of the largest and handsomest moths, with thick woolly bodies, widely feathered antennæ, and wings without bristles or hooks, and generally with a conspicuous spot in the middle of each; they fly during twilight. The most beautiful of all is the luna moth (*attacus luna*), with long-tailed wings of light green expanding $4\frac{1}{2}$ to $5\frac{1}{2}$ inches, each having a transparent spot encircled with white, red, yellow, and black; the larva is bluish green, from 2 to 8 inches long, and when at rest nearly as thick as the thumb; it is found on walnut and hickory trees, and spins a strong cocoon within a cavity formed by the drawing together of a few leaves. The polyphemus moth is larger, expanding to 6 inches, of a dull ochre yellow color, without tails to the wings. The *A. Cecropia* expands to $6\frac{1}{2}$ inches, with rounded untailied wings of a grizzled dusky brown, with a red eye spot with white centre and black edge. The *A. Prometheus* expands to about 4 inches. All these moths make very large cocoons entirely of silk, far

surpassing in strength those of the silkworm, and capable of being manufactured into very durable fabrics; the first two are well worthy the serious attention of persons interested in silk culture. Two other moths of this family, whose processionary larvæ are furnished with severely stinging prickles, are the *Saturnia Io*, expanding from $2\frac{1}{4}$ to $3\frac{1}{4}$ inches, and the *S. Maia*, resting like the former with the wings closed, expanding to about 8 inches. 6. *Ceratocampa*, or horned caterpillars, being armed with thorny points, some of the anterior long and curved like horns; in the moths the short antennæ are feathered at the basal half and thence naked to the tip; the wings, closed when at rest, have no hooks nor bristles; this family, according to Harris, is exclusively American. One of the largest, rarest, and most magnificent, is the royal walnut moth (*ceratocampa regalis*), expanding 5 or 6 inches, the fore wings olive-colored with yellow spots and red lines, the hind wings orange red with yellow patches and olive spots; the horns of this formidable-looking larva are unable to wound. Other horned larvæ belong to the genus *dryocampa*, as the imperial moth (*D. imperialis*), with yellow wings sprinkled and spotted with purple brown, expanding to about 5 inches. 7. *Zuzerada* or *hepialida*, whose larvæ are concealed in the wood and pith of plants like the borers of the hawk moths; these larvæ are whitish, soft, nearly naked, with horny heads, and 16 legs; they make imperfect cocoons. Here belong the ghost moth of Europe (*hepialus humuli*), very injurious to the hop vine; the famous *cosus ligniperda*, so destructive to the elm and willow, minutely described by Lyonnet, and hence called by an enthusiastic Frenchman "the immortal worm;" and various borers of the locust tree in this country, the carpenter moths of the genus *xyloicus* (Newman), which includes the *C. ligniperda*; the last are sometimes called goat moths from the strong odor which they emit. 8. *Psychada*, or sack-bearers, from the larvæ bearing about with them cases in which they live, made of bits of straw, leaves, and sticks, and lined with silk; they undergo their change within these; here belong the genera *psyche*, *acetius* (drop or basket worms), and *perophora*. 9. *Notodontada*, so called from the hunched or toothed back of the larvæ; some are naked, others slightly hairy, with 16 legs, of which the last pair are sometimes modified into a forked caudal appendage; some seem to be without legs, showing only the soles of the feet. Here belong the odd-shaped *limacodes* or slug caterpillars, found on forest and orchard trees; the *diceranura* or fork tails, the last pair of legs being held upward; and the various species of the old genus *notodonta*, as the *N. unicornis* and *concinna*. II. *Noctua* or owl moths, equivalent to the *noctuulites* of Latreille, so called from their flying chiefly at night like owls. This tribe contains many thick-bodied and swift-flying moths, which generally have long and tapering antennæ, long tongue, distinct

feelers, wings fastened by bristles and hooks and roofed when at rest; the colors are usually dull, and shades of gray or brown; the larvæ are for the most part naked, slow-moving, usually with 16 legs, and nearly cylindrical; some make cocoons, while others go into the ground to transform. Their injury to vegetation is considerable. Among them are the maple moths (*apatela*) of America and Europe; the nonagrians, like the spindle worms; the agrotidians or rustic and dart moths and cut worms; and the manestrians, like the zebra, painted, and wheat caterpillars, and cotton worms. III. *Geometra* or *phalanites* of Latreille, including the geometers, span worms, and loopers, so called from their manner of moving. The characters of this tribe are sufficiently given under CANKER WORM; they arch their backs when creeping, and when in repose fix themselves by their hind feet and extend the body immovable like a twig or branch. It contains the genus *phalana*, which has been divided into many sub-genera. IV. *Pyratides* or *delta* moths (included in the *deltoides* and *tineites* of Latreille), nearly allied to the geometers, and so called from the triangular Δ form of the closed wings; the body is long and slender, the fore wings rather narrow and elongated, antennæ long and generally simple, and the legs slender; most of them fly by night, preferring moist localities. Here belong the meal moth (*pyralis farinalis*), the grease or tabby moth, the day-flying *simathis* (remarkable for their gyrations after alighting), the aquatic *hydrocampa*, &c. (living in cylindrical leafy cases in the larva state), and the hop vine *hypena*. V. *Tortrices* or leaf-rollers, so named from the habit of most of their larvæ of making rolls of leaves fastened by silk, serving both for habitations and food; they have 16 legs, and are mostly naked. The moths rarely expand more than an inch, and carry their wings when at rest like a steep roof; the fore wings are very broad at the shoulders, and are generally prettily banded and spotted; the hind wings are plain; the antennæ thread-like, the tongue short, the body thick, and the legs short; they fly only at night, and are most abundant in midsummer. The bud caterpillars are frequently very injurious in orchards and flower gardens, fastening the tender leaves together and eating the substance of the bud, and some bore into and destroy young fruits; apricots, peaches, and plums often suffer much in this way. The turpentine moths pierce the tender shoots and terminal buds of the fir and pine trees, the seat of their depredations being indicated by the oozing of the resin. The apple worm, the larva of the *carpocapsa pomonella* (the codling or apple moth) is unfortunately too well known to fruit growers; the moth, which expands $\frac{1}{2}$ of an inch, may be known by a large oval brown spot, edged with copper, on the hinder margin of the fore wings; they lay their eggs on the young summer apples in July evenings, dropping them one by one in the hollow at the bloss-

some end of the fruit; the larvæ are hatched in a few days, and at once burrow toward the centre, only one being commonly found in each fruit; it reaches the full size in about 3 weeks, by which time it has burrowed in various directions, getting rid of the refuse fragments by a hole which it gnaws in the side, through which it also escapes after the premature fall of the fruit; they make silken cocoons, and are not generally changed to moths till the following summer, though in some cases the earlier worms may become moths the same year and lay eggs of a second generation. Pears and cranberries are affected by a worm apparently the same as that of the apple. VI. *Tinea (tineites, Latr.)*, the moths *par excellence* of the household, the destroyers of clothing, furs, &c., and those referred to in the Scriptures and the old writers. The larvæ are smooth, with 16 feet, living usually in cases made from the fragments of the substances which they devour fastened together with silk, in which they move freely and unseen. Though the smallest of the *lepidoptera*, they are among the most beautiful and the most destructive. Here belong, among the *crambida*, the bee or wax moth (*Galleria cereana*), whose depredations in hives have been noticed under *BEES*; among the *tineada*, the clothes moth (*tinea vestianella*), carpet moth (*T. tapetella*), fur moth (*T. pellionella*), hair moth (*T. crinella*), and grain moth (*T. granella*); and among the *ypomontada*, the pack moth (*anacampsis sarcitella*), destructive to wool and its fabrics, and the Angoumois grain moth (*butalis cereatella*). Objects of natural history, articles of food, and even books have their destroyers in the shape of the larvæ of these minute moths. The best preventives against moths in household articles are to put them away before May or June where the moths cannot reach them when about to lay their eggs; to expose them to the air and sun for hours, after a good beating to dislodge any insects or eggs; to brush over their retreats with turpentine; to strew camphor, black pepper, tobacco, or shavings of Russia leather under or among carpets, woollens, furs, or feathers, when they are put away for the summer; the use of camphor wood or cedar trunks; corrosive sublimate washings, tobacco and sulphur fumigations, and the action of heat and steam. For an account of the American and European grain moths, see *WHEAT MOTH*. VII. *Alucita* or feather-winged moths, equivalent to the *pterophorites* of Latreille. These may be known by the longitudinal division of their wings into narrow fringed branches like feathers; the antennæ are slender and tapering, the tongue long, the body and legs long and slender, the wings at rest not covering the body, but standing out like a folded fan; the flight is slow and feeble, sometimes diurnal, sometimes nocturnal; the larvæ are short and thick, slightly hairy, with 16 legs, living on leaves and flowers, and constructing no cases. There are few species, and they are rarely injurious to man.

MOTHER CAREY'S CHICKEN. See *PZ-TREL*.

MOTHER OF PEARL. See *PEARL*.

MOTHERWELL, WILLIAM, a Scottish poet and journalist, born in Glasgow, Oct. 18, 1797, died in that city, Nov. 1, 1835. He was educated chiefly at the grammar school in Paisley, and at the age of 15 was placed in the office of the sheriff clerk of that place. In 1819 he was appointed sheriff clerk depute of the county of Renfrew, and held that situation until 1829. He early developed a taste for the antique, suggested perhaps by his frequent researches among old manuscripts in the sheriff's office, and which impregnated most of his poetry. He possessed also a remarkable talent for drawing figures of men in armor and similar designs, which even in his school days attracted the attention of his teachers. As early as his 14th year he is said to have sketched the outline of his well known poem, "Jeannie Morrison," the heroine of which was a school companion of his childhood; but he does not appear to have occupied himself seriously with poetical composition previous to 1818-'19. In the latter year he edited the "Harp of Renfrewshire," a collection of songs and poems by Renfrewshire poets, with an introductory criticism; and he subsequently contributed articles in prose and verse to the "Paisley Advertiser." In 1827 appeared his "Minstrelsy, Ancient and Modern," with an elaborate historical introduction and notes, a work containing several original poems in antique guise, and which brought him into direct communication with several distinguished literary men. Subsequently he edited for a year the "Paisley Magazine," and printed in it some of his best poems, and between 1828 and 1830 conducted the "Paisley Advertiser." In the latter year he took charge of the "Glasgow Courier," a journal of very decided tory principles, with which he remained connected until his death. In 1832 he published a collection of his poems, most of which, in consequence of his absorbing duties as a political journalist, were fugitive, and soon after commenced in conjunction with James Hogg an annotated edition of Burns's works, which he did not live to complete. In 1849 a greatly enlarged edition of his poetical remains, accompanied by a memoir, was published in London.

MOTHERWORT (*Leonurus cardiaca*, Linn.), the name of a homely plant introduced from Europe, belonging to the mint family or natural order of *labiata*. It is frequently met with around walls, fences, and neglected spots near farms and gardens. The root of the motherwort is perennial, stem 2 to 5 feet high, branching near the base, large and downy; leaves 2 to 4 inches long, lobed and broad, growing narrower toward the top of the stem, the uppermost entire, all bending downward, and downy underneath. The flowers, which will be found to be very pretty if carefully examined, are borne in many whorls; the calyx has rigid and prickly teeth; the corolla, hairy without, is variegated

with white and red; the seeds are triquetrous, truncate at summit, hirsute, and numerous, and freely vegetate, helping to render the species, as Dr. Darlington ("Useful Plants and Weeds") observes, an unsightly and disagreeable weed. Another species (*L. marrubiastrum*, Linn.), he adds, has become partially naturalized in some districts of Pennsylvania, but does not threaten to become so prevalent and troublesome. The common motherwort has a strong, pungent odor, and, as its name indicates, is principally used as a medical remedy in diseases of females; in hysteria, nervous complaints, morbid nervous excitability, in many chronic diseases when attended with restlessness, wakefulness, spinal irritation, neuralgic pains in the head, stomach, and liver. The infusion of the root is diuretic; the seeds have been given in bilious colic; a decoction of the plant is frequently used in menstrual colic, suppression of the menses, and lochia.

MOTLEY, JOHN LOTHROP, an American historian, born in Dorchester, Mass., April 15, 1814. He was graduated at Harvard college in 1831, and thence proceeded to the university of Göttingen, where he continued about one year, and another year at the university of Berlin, after which he travelled for some time in the south of Europe, chiefly in Italy. On his return to America he studied law, and was admitted to the bar in 1836-'7. He displayed little liking for the drudgery of the law, and scarcely practised his profession. In 1839 he published a novel entitled "Morton's Hope, or the Memoirs of a Young Provincial." In 1840 he received the appointment of secretary of legation to the American embassy to Russia. He held the post about 8 months, when he resigned and returned to the United States. In 1849 he produced a second historical fiction, entitled "Merry Mount, a Romance of the Massachusetts Colony." This work, like the preceding, although well written, and giving abundant evidence of talent, attracted little attention. Meanwhile he had contributed various articles to some of the leading reviews. Among these papers, one on De Toqueville's "Democracy in America," and another on Goethe and his writings, appeared in the "New York Review." Still another of very striking character, on Peter the Great, was published in the "North American Review" for Oct. 1845. Soon afterward he became interested in the history of Holland, and began to collect authorities for a work on that subject, writing enough to form two volumes; but, unable to gather such material at home as he deemed necessary for the thorough prosecution of the subject, he embarked for Europe with his family in 1851. On examination he became dissatisfied with his labors, threw aside all that he had written, and began his entire task anew. In Berlin, Dresden, and the Hague, he passed the principal portion of his time during the next 5 years, engaged upon the composition of his history, entitled "The Rise of the Dutch Republic." It was published in London in 1856

(3 vols. 8vo.), and was at once reproduced in New York. It was also reprinted in English at Amsterdam, beside being translated into Dutch under the supervision of the historian M. Bakhuizen van den Brink, who prefixed an introductory chapter. A German translation was published at Leipzig and Dresden; and the 1st volume of a French translation, with an introduction by Guizot, was published in 1859. The sale of the work in England, to Nov. 1857, had reached 15,000 copies; and in America, up to June, 1860, 7,590 copies had been printed. Mr. Motley visited the United States for a short time in 1858. He is now in Europe pursuing his researches regarding the history of Holland. A new work entitled "The United Netherlands" (3 vols. 8vo.) is announced (Oct. 1860) for publication in London. Since the publication of his "Dutch Republic" he has been elected a member of various learned societies in Europe and America, among them of the institute of France in place of Mr. Prescott, deceased. In 1860 he received the degree of D.O.L. from the university of Oxford, and that of LL.D. from Harvard college.

MOTION. See MECHANICS.

MOTMOT (*momotus*, Bris.), a genus of American fissirostral birds of the family of rollers and sub-family *momotinae*. The single genus is characterized by a bill rather long, slightly curved, with compressed sides, hooked and obtuse tip, and lateral margins serrated; wings moderate and rounded, with 4th to 6th quills nearly equal and longest; tail lengthened and graduated, with the 2 middle feathers usually longer than the others; tarsi as long as the middle toe, covered in front with narrow transverse scales; toes unequal, the outer nearly as long as the middle and united at the base as far as the 2d joint, the inner short and slightly united, the hind short and weak, and the claws compressed and curved; the tongue is long and barbed as in the toucans. The name is derived from the peculiar notes. There are about a dozen species, bold and wild, inhabitants of tropical America and the West Indies, especially in the deep shades of the forests or gloomy recesses of old buildings; they are usually solitary in the daytime, perching with the head drawn between the shoulders, solemn and still except for an occasional melancholy croak; they are most lively at early morning and in the dusk of evening, pursuing insects in short flights; they also eat fruits, lizards, and snakes, which are tossed into the air from the point of the bill and swallowed; they sometimes devour the eggs of other birds. The nest is made in holes of trees or banks of earth. They are said to peck off the barbs from a portion of the stem of the central tail feathers, leaving a rounded feathered surface at the tip. The best known species is the Brazilian motmot (*M. Brasilensis*, Lath.), about the size of a blackbird, of a deep rich green color, with bluish forehead, violet back of head, and black crown. The movements are awkward on the ground.

MOTT, LUCRETIA, an American minister of the society of Friends, born in Nantucket, Jan. 8, 1798. Her parents, Thomas and Anna Coffin, were natives of that island, and removed thence to Boston in 1804. After attending school in that city for 2 years, she spent 8 years at a Quaker boarding school in the state of New York, the latter part of the time as assistant teacher. There her attention was first called to the duty of abstaining from the use of slave produce, and succeeding years deepened her convictions. In 1809 she went to Philadelphia, to which city her parents had removed, and in 1811 she married James Mott, who entered into partnership with her father. The depression in business consequent upon the war of 1812, and the death of Mrs. Mott's father, soon after made it necessary for her to engage in business with her husband. In 1817 she took charge of a large day school in Philadelphia, until compelled by other duties to relinquish it. Soon after this, in her 26th year, her labors as a preacher began. After an interval of several years devoted to the care of a family of 6 children, she travelled through New England, Pennsylvania, Maryland, and a part of Virginia, preaching against slavery, and advocating the peculiar tenets of the society of Friends, obedience to the inward light, and a steadfast adherence to peace principles. At the time of the division in that society in 1827, Mrs. Mott adhered to the Hicksite party, opposing any approximation to a more orthodox faith, and earnestly urging the duty of negro emancipation, and of abstaining from the use of goods obtained by slave labor. She took an active part in the organization of the American anti-slavery society in Philadelphia in 1833, and with other abolitionists was subjected to the mob violence which resulted in the burning of Pennsylvania hall, a new building opened for anti-slavery meetings. Notwithstanding the odium attaching to the name of abolitionist at that time, she continued to preach against slavery, advocating the interests of the negro race, speaking occasionally in their churches, and aiding in their charitable associations. She was a delegate to the world's anti-slavery convention held in London in 1840, but was excluded from a seat as delegate, the right of women to take part in public assemblies being denied by a majority of the members. At the same time, she with the other delegates received every courtesy and attention; and as strangers and abolitionists, they were welcomed to the convention. In 1848 the first woman's rights convention was held at Seneca Falls, N. Y.; and Mrs. Mott took an active part in that and subsequent conventions, which have been held annually, for advocating the equal rights of women. After the passage of the fugitive slave bill, Mrs. Mott attended all trials of fugitive slaves in Philadelphia, encouraging them by her presence and words of sympathy, and endeavoring to evoke a public sentiment in opposition to their surrender to their masters.

MOTT, VALENTINE, M.D., LL.D., an American surgeon, born at Glen Cove, Long Island, Aug. 20, 1785. His father, Dr. Henry Mott, practised medicine for many years in the city of New York. The son was graduated as M.D. at Columbia college in 1806, and proceeded to London, where, as well as in Edinburgh, he studied clinical surgery and medicine under the most eminent professors. On his return in 1809 he was called to fill the chair of surgery in Columbia college, a position which he held till the medical department of that institution was merged in the college of physicians and surgeons in 1818. Difficulties arising with the trustees and professors on principles of collegiate government, he withdrew from that school in 1826, and with Dr. Hosack, Dr. Francis, Dr. Mitchell, and others, founded the Rutgers medical college, which, owing to a question about its charter, existed but 4 years. Since 1830 Dr. Mott has lectured in New York in the college of physicians and surgeons, and in the university medical college, as professor of surgery and relative anatomy, of which latter branch of science he is the founder. His professional reputation, however, is mainly due to his original operations as a surgeon. As early as 1818 Dr. Mott placed a ligature around the brachio-cephalic trunk, or arteria innominata, only two inches from the heart, for aneurism of the right subclavian artery, for the first time in the history of surgery. The patient survived the operation 26 days, indicating the feasibility of so dangerous an undertaking; and what is most remarkable to the practitioner, Dr. Mott states that, though all apparent supply of blood vessels was cut off from the right arm, pulsation could be distinctly felt in the radial artery, and the limb presented no evidences of sphacelation. On the 26th day, however, secondary hæmorrhage having set in, the life of the patient was speedily terminated. He excised the entire right clavicle for malignant disease of that bone, where it was necessary to apply 40 ligatures; an operation which Dr. Mott himself asserts to be the most dangerous and difficult that can be performed upon the human body. Though many have tried to rob him of the originality of this operation, a priority of 30 years sufficiently establishes it as his. The patient is still living and enjoys perfect health. Dr. Mott was the first to tie the primitive iliac artery for aneurism. He has tied the common carotid 46 times, cut for stone 165 times, and amputated nearly 1,000 limbs. He early introduced his original operation for immobility of the lower jaw, and succeeded after many eminent surgeons had failed. In 1821 he performed the first operation for osteo-sarcoma of the lower jaw. He is the first surgeon who removed the lower jaw for necrosis. Notwithstanding his advanced age, he continues to fulfil the duties of a lecturer and practitioner with vigor and clearness. Sir Astley Cooper said in regard to Dr. Mott: "He has performed more of the great operations than any man living, or that ever did

live." In 1835 Dr. Mott visited Europe for his health, and travelled extensively through England, the continent, and the East. His principal works are as follows: "Travels in Europe and the East" (8vo., New York, 1843); translation of Velpeau's "Operative Surgery" (4 vols. 8vo., New York); "Anniversary Discourse before the Graduates of the University of New York" (1860); "Mott's Oliniques," reported by Samuel W. Francis (13mo., 1860); and several separate papers concerning special operations and cases, published in medical periodicals and in the "Transactions" of the New York academy of medicine. He has received many honors from learned American and European associations.

MOTTE, COUNTESS DE LA. See LAMOTTE.

MOTTE CADILLAO, ANTOINE DE LA, the founder of Detroit, born in Gascony about 1660, died subsequent to 1717. He was of noble birth, came while still young to New France, was a captain in the army in service in Acadia, and in 1689 was ordered to Versailles by Louis XIV. to furnish information in relation both to New France and the English colonies, and especially to the condition of the harbors and defences on the coast. He was ennobled by the title of Sieur Bonaguat and Mount Desert; and Mount Desert island and a large tract of land on Frenchman's bay, Maine, were granted to him. In 1694 he was appointed by the governor-general Frontenac to the command of Michilimackinac, then the most important post in the Indian territory, and, next to Montreal and Quebec, the largest place in Canada. He remained here until 1697, and in 1699 visited Versailles, laid before the king his project of establishing a permanent post and settlement at Detroit, that should become the great centre of commerce and civilization in the north-west, and obtained the royal consent with a promise that he should be furnished with 200 settlers and 6 companies of soldiers. He returned to Canada, but the governor-general did not favor the project; and after unexpected delays and difficulties, on July 24, 1701, he landed at Detroit with 50 artisans and settlers and 50 soldiers, and laid the foundations of the present city, which he named Fort Pontchartrain in honor of the French colonial minister. He was commandant, and also stood in the relation of feudal lord to the inhabitants. But from the very first the little settlement had many foes, among whom were the Iroquois, the Jesuits, the governor-general, and all the Canadian officials. Unlike other posts, Detroit was established by the direct command of the king, De la Motte receiving his commission directly from Versailles; and this excited jealousy and dislike. The post itself, too, threatened to divert profitable Indian trade from Montreal and Quebec. In 1704 De la Motte was arrested at Quebec upon charges of official misconduct, but, after vexatious delays, was triumphantly acquitted. Subsequently he vindicated his conduct at the court of Versailles against similar charges instigated by his enemies. In 1711 he was ap-

pointed governor of Louisiana, then almost an unknown wilderness. Those exaggerated ideas of the boundless wealth of the valley of the Mississippi, which afterward culminated in the famous "Mississippi scheme" of John Law, were already prevailing. De la Motte on this new field manifested the same qualities that had ever distinguished him, but it was not within the power of man to meet the extravagant expectations that were indulged by monarch and people; and in 1717 the John Law scheme was perfected, and the government and trade of Louisiana passed into the hands of his new "Western Company." De la Motte returned to France. His career after this and the time and place of his death are enveloped in obscurity. He probably died soon after, or his restless activity and high ambition would have brought him into notice. His voluminous correspondence shows him the master of a clear, vigorous style, and a persuasive eloquence. He left an only daughter; and the commonwealth of Massachusetts in 1787 confirmed to his granddaughter, Mme. Grégoire, so much of Mount Desert island as was not already granted to others.

MOTTEUX, PIERRE ANTOINE, an English author, born at Rouen, in Normandy, in 1660, died in London, Feb. 19, 1718. On the revocation of the edict of Nantes he settled in London and established a large Indian warehouse in Leadenhall street; but, being a good linguist, he ultimately obtained a situation in the foreign letter department of the post office. His death was sudden, and attended with suspicious circumstances. Motteux acquired a complete mastery of the English language, and wrote several works in it. The principal of these are dramatic: "The Loves of Mars and Venus" (London, 1697); "Beauty in Distress" (1698); and "The Amorous Miser" (1705). He also published a poem "On Tea" in 1722, and translated "Don Quixote" (4to., London, 1701), and "Rabelais" (4to., 1708) into English.

MOULINS, or MOULINS-SUB-ALLIER, a town of France, capital of the department of Allier, on the right bank of the Allier, 213 m. by railway S. S. E. from Paris; pop. in 1856, 16,391. Outlery, hardware, silk, and cotton hosiery are manufactured. There are 10 fairs yearly. Fitz-James, duke of Berwick, natural son of James II. by Arabella Churchill, and Marshal Villars, the antagonist of Marlborough at Malplaquet, were born in this town.

MOULTON, JOSEPH WHITE, an American historian, born in Stratford, Conn., in June, 1789, has resided in New York city from his childhood, where for many years he practised the profession of the law. His curious and laborious antiquarian researches into the Dutch records and old Dutch patents of that city, and the 80 volumes of Dutch documents in the state office at Albany, brought to light the administration of Peter Minuits, the first governor or director-general for 9 years prior to that of Wouter Van Twiller. He has published a history of early New York (part i., 1824; part ii.,

1826), "New York 170 Years Ago" (1849), and several works on legal subjects.

MOULTRIE, a central co. of Ill., drained by the Kaskaskia river and its branches; area, 320 sq. m.; pop. in 1855, 4,485. It has a level or undulating surface and a fertile soil. The productions in 1850 were 373,680 bushels of Indian corn, 60,040 of oats, 6,148 of wheat, and 15,968 lbs. of wool. There were 5 saw mills, 7 churches, and 380 pupils attending public schools. The Terre Haute and Alton railroad crosses the southern portion. Capital, Sullivan.

MOULTRIE, Fort, a fortress on Sullivan's island at the mouth of Charleston harbor, where a memorable victory was gained by the troops of South Carolina under Col. Moultrie over a British squadron commanded by Sir Peter Parker, June 28, 1776. Early in that month a fleet of 40 or 50 sail, comprising ships of war and transports conveying troops, arrived off Charleston with a view of investing the place, which was then occupied by the Americans. Hasty preparations for defence were made in the city and its suburbs, and a fort on Sullivan's island destined to command the entrance to the harbor, and which was then building under the direction of Col. Moultrie, was ordered by John Rutledge, the president of South Carolina, to be finished without delay. On the 9th Gen. Charles Lee, who held the chief command in Charleston, made a tour of inspection to Sullivan's island, and expressed much dissatisfaction with the character and position of the work, declaring that it was no better than a "slaughter pen." He subsequently advised Rutledge to abandon the post; and failing to convince him of the impossibility of holding it half an hour against the fire of the British fleet, he directed Moultrie to construct bridges for his retreat to Haddrell's point on the main land. A few days after he detached 600 men from the garrison, and took away also a large portion of the ammunition. In spite of these discouragements, Moultrie pushed forward the work with vigor. To render victory easy and certain, the British commanders had organized an attack on the fort by the fleet and another by a land force in the rear; and with this view Sir Henry Clinton had occupied with 8,000 men a low sandy island called Long island, opposite the east end of Sullivan's island, with which it was supposed to communicate by a ford at low water. The ford proved impracticable, and the further deliberations which this fact provoked, together with the prevalence of storms, preventing the fleet from coming into action, gave Moultrie many precious hours for labor. Notwithstanding these advantages, the morning of the 28th found the fort only partially completed. In its general plan it presented a "square with a bastion at each angle, built of palmetto logs, dovetailed and bolted together, and laid in parallel rows 16 feet asunder; between these rows the space was filled with sand. On the eastern and northern sides the palmetto wall was only 7 feet high, but it was surmounted by

thick plank so as to be tenable against a scaling party; a traverse of sand extended from east to west. The southern and western curtains were finished, with their platforms, on which cannon were mounted." In the rear of the fort and opposite Long island, Col. Thompson, with 800 men and 2 cannon, was posted behind a series of breastworks to resist the landing of Clinton. The fort mounted 81 guns, and the garrison consisted of 435 men, rank and file. To the last Lee counselled the abandonment of the work, telling Moultrie that the British fleet would knock it to pieces in half an hour; to which the latter replied: "We shall then fight them behind the ruins. I am not at all uneasy," he added, "we shall beat them off." At 10½ A. M. the British fleet got under weigh, and soon after the Active of 28 guns, the Bristol of 50 guns, in which was Sir Peter Parker, the Experiment, also of 50 guns, and the Solebay of 28, anchored with springs on their cables about 350 yards from the fort, against which they commenced a furious cannonade. The Thunder-bomb covered by the Friendship also threw a number of shells against it. To the surprise of all on board the fleet, the repeated broadsides from the heavy frigates seemed to produce little or no effect upon the fort, in the soft, spongy wood of which the balls were harmlessly buried. Far otherwise, however, was the result of the fire upon the ships. Moultrie, having a limited supply of ammunition, discharged his guns with such deliberation that every shot told upon the hulls or rigging of the enemy. The admiral's ship in particular became the target at which the garrison aimed, and so great was the slaughter on board that at one time only Sir Peter Parker remained on the quarter deck. The other ships suffered proportionally. Meanwhile Sir Henry Clinton attempted to cross over to Sullivan's island and cooperate with the fleet; but his detachment had hardly embarked in boats for that purpose when it was recalled, it being very evident that "the landing was impracticable, and would have been the destruction of many brave men without the least probability of success." A more formidable movement of a portion of the British fleet, consisting of the Actæon, the Sphinx, and the Siren, each of 28 guns, toward Haddrell's point, whence they could have enfiladed the fort so as to render it untenable, was rendered abortive by their running aground on a bank of sand known as the lower middle ground, where they remained inactive during the remainder of the engagement. The fire between the main fleet and the fort, however, continued without cessation, the result of the conflict being watched by thousands from the wharfs and roofs of Charleston in anxious suspense. At one period the American flag, a white crescent from view, and the inhabitants, supposing the fort had surrendered, prepared to defend themselves. It had however been cut down by a ball from the enemy, and was recovered by William Jasper, a sergeant, who leaped through an embrasure to

the ground amid a heavy fire, and returned in safety with the color, which he fixed on the summit of the bastion nearest to the enemy. Moultrie and his officers presented an example of equal coolness to their men, and smoked their pipes with composure during the hottest fire of the enemy. Between 1 and 2 o'clock P.M. Moultrie sent to Lee for more powder, his ammunition being nearly expended, and was advised in reply to spike his guns and retreat. Rutledge, however, sent him 700 pounds, with which he was enabled to continue his defence to such purpose that at sunset every gun on the fort but one was still in position. At that hour the enemy's fire began to slacken; the Bristol and Experiment were so riddled as to have almost become wrecks; all hope of coöperation from Clinton was abandoned, and at 9½ P. M. the ships slipped their cables and dropped down with the ebb tide to their previous moorings. Of the 3 ships which grounded, the Siren and Sphinx escaped, but the Actæon was set on fire by her crew and abandoned. At the expiration of several weeks the discomfited squadron returned to the north. The British loss in this engagement was 225 killed and wounded. The Americans lost 11 killed and 26 wounded, and the fort remained comparatively uninjured.

MOULTRIE, WILLIAM, an American revolutionary general and statesman, born in South Carolina in 1731, died in the same state, Sept. 27, 1805. He was of Scottish descent, his parents having emigrated to South Carolina at the beginning of the 18th century. At an early age he appears to have won the confidence of his fellow citizens by his cool and steady character, and in 1761 he was appointed a captain of foot in a militia regiment raised to defend the frontier against the incursions of the Cherokees. He rendered important services in this capacity, and acquired a knowledge of military affairs which proved of great advantage to him in the subsequent war of independence. He took part in the domestic agitations which prepared the popular mind for this latter event, and from the outset proved himself a firm friend of the colonies, notwithstanding some of his near relations arrayed themselves on the side of the crown. When South Carolina, following the example of the sister colonies, raised troops to resist the aggressions of the mother country, Moultrie was appointed to the command of the 2d colonial regiment, and he also represented the parish of St. Helena in the provincial congress of 1775. He was one of those who led in the seizure of the public arsenals, arms, and forts; but the approach of a British land force and fleet under Sir Henry Clinton and Admiral Sir Peter Parker, to invest Charleston, first brought his regiment into active service. In March, 1776, he was designated to construct a fortress on Sullivan's island at the mouth of Charleston harbor, and was still busy at the work when the enemy made his appearance. (See **MOULTRIE, FORT**.) In commemoration of Moultrie's bravery in defending the fort, it was subse-

quently called after his name; and he even rose in the estimation of Gen. Lee, who had strongly opposed the holding of the fort, and had desired to deprive Moultrie of his command, but who now proposed to him to lead an expedition against St. Augustine, Florida, then commanded by a brother of Moultrie, who was a royalist. Moultrie readily accepted the command, but the limited resources of the state rendered its execution impossible. He was soon after put upon the continental establishment, was made a brigadier, and had in charge the military interests of Georgia as well as South Carolina. For nearly 3 years South Carolina enjoyed an exemption from foreign attacks, her troubles being wholly internal; but in the spring of 1779 the British, who occupied Savannah in force, took advantage of the absence of Gen. Lincoln with most of the continental troops in Georgia, to make a demonstration against Charleston. In the latter part of April Gen. Prevost advanced upon the town with a large force of regular troops and Tories. Moultrie, who was stationed on the N. side of the Savannah river, with 1,000 or 1,200 militiamen drawn from the neighboring country, hastened to throw himself in his path, and, by retarding the progress of the enemy, enabled the people of Charleston to place themselves in a condition of defence. The return of Lincoln from Georgia subsequently compelled Prevost to retire to Savannah. After a brief season of repose, Charleston was in the spring of 1780 attacked for the third time by a strong land and sea force, and Moultrie, who was second in command in the town, shared in the capitulation of the American troops. While a prisoner he was approached by the British officers with offers of pecuniary compensation and the command of a British regiment stationed in Jamaica if he would leave the American service. He replied: "Not the fee simple of all Jamaica should induce me to part with my integrity." After remaining nearly two years a prisoner, he was permitted to go to Philadelphia, where in 1782 he was exchanged and released. Congress soon after made him a major-general, but too late to enable him to render any active military service to his country. In 1785 he was elected governor of South Carolina, and again in 1794. Soon afterward he retired into private life, and devoted his remaining years to the preparation of his "*Memoirs of the Revolution*" (2 vols., New York, 1802), a work particularly valuable to the student of American history.

MOUND, a term used technically in the United States as synonymous with barrow or tumulus, designating a large class of aboriginal antiquities or earth works, scattered through the valleys of the Mississippi river and its tributaries, but also found in New York, Pennsylvania, and other states to the E. of the Alleghany mountains. The term is also understood to include those vast lines of circumvallation or embankment, often regular in form in works regarded as sacred or symbolical, and some-

times irregular, enclosing defensible positions, and obviously of military origin, found in the Mississippi valley. (See *AMERICAN ANTIQUITIES*.)

MOUNT, WILLIAM SIDNEY, an American artist, born in Setauket, Long island, Nov. 26, 1807. He was bred a farmer's boy, but at the age of 17 removed to New York and became an apprentice to his brother, Henry S. Mount, who was then by profession a sign painter. Showing a strong taste for art, he was in 1826 placed in the school of the national academy of design, and in 1828 produced his first picture, a portrait of himself. In 1829 he established himself in New York as a portrait painter, and at the same time attempted scriptural pieces, such as the "Raising of the Daughter of Jairus," and "Saul and the Witch of Endor." A "Rustic Dance," which appeared in the exhibition of 1830, attracted much attention. His pictures of humorous subjects have since been numerous. Negro physiognomy and scenes of negro life in particular have been treated by him with success. Among his best known works are: "Men husking Corn," "Walking the Crack," "The Sportsman's last Visit," "The Raffle," "The Courtship," "Nooning," "Bargaining for a Horse," "The Power of Music," "Music is Contagious," "Just in Time," "California News," "The Lucky Throw," "Banjo Player," "Bone Player," &c., several of which have been widely distributed through the medium of colored lithographs. He has also steadily practised portrait painting down to the present time. Since 1832 he has been a member of the national academy of design.

MOUNT AUBURN. See *CAMBRIDGE, MASS.*

MOUNT DESERT, an island of the state of Maine, at the southern extremity of Hancock co., situated in Frenchman's bay, about 40 m. S. E. from Bangor, lat 44° 20' N., long. 68° 30' W.; pop. in 1850, 3,509. The island is 15 m. long and 12 broad, and has an area of about 100 sq. m. It is divided into 3 towns or townships, Eden, Tremont, and Mount Desert, and contains 6 small villages, 9 post offices, 51 schools, and 8 churches. There are several good harbors. Ship building is carried on, and many vessels owned in the island are employed in the cod and mackerel fisheries. A narrow bay or sound runs from the ocean at the S. side of the island into the interior in a northerly direction to the distance of 6 or 8 m. The scenery of the island is very grand and beautiful. The greater part of its surface is covered by a group of granite mountains 13 in number, whose highest peak, Mt. Adam or Mt. Green, rises to an elevation above the sea variously computed at 1,500 and 2,300 feet. High up among the mountains are many beautiful lakes, the largest of which is several miles in length; these lakes and the streams that flow from them abound in trout. The S. E. coast of the island is lined with stupendous cliffs several hundred feet in height; the most remarkable of these are Great Head and Schooner Head. In Frenchman's bay, on the E. side of Mount Desert, are 5 high

rocky islands called the Porcupines, and about 20 m. to the southward in the open ocean is Mount Desert rock, the site of a noted lighthouse. Mount Desert is much resorted to in summer by artists and others for the beauty of its scenery, and is connected by steamer with Rockland, Bangor, Portland, and Boston. The island was discovered and named by the French about the beginning of the 17th century. M. De La Saussaye and Fathers Quentin, Lalemant, Biard, and Masse, with 25 colonists from France, landed here in May, 1613, built a small fort and a few cabins, and called the place St. Saviour. This settlement was forcibly broken up in a few weeks by Gov. Argall of Virginia. The first permanent settlement on Mount Desert was made by Abraham Somes, who in 1761 built a house at the head of the sound.

MOUNT EVEREST. See *HIMALAYA MOUNTAINS*, vol. ix. p. 176.

MOUNT MITCHELL. See *BLACK MOUNTAINS*.

MOUNT VERNON. I. The capital of Knox co., Ohio, on the Vernon river, and on the line of the Sandusky, Mansfield, and Newark, and the Springfield, Mount Vernon, and Pittsburg railroads (the latter completed only to Delaware, 22 m. from Mount Vernon), 45 m. N. E. from Columbus; pop. in 1859, about 7,000. It is well and compactly built on gently ascending ground, is lighted with gas, has many elegant mansions, and in 1859 contained 26 stores, a bank, 2 flour mills, 2 saw mills, 8 or 10 churches, and 3 newspaper offices. II. The capital of Posey co., Ind., situated on a bend of the Ohio river, about 160 m. S. W. from Indianapolis; pop. in 1859, about 2,500. It contains, beside the county buildings, 15 stores, a bank, 2 hotels, 2 steam flour mills, 2 saw mills, several manufactories, a foundery, planing mill, 7 churches, and a number of schools and benevolent and literary institutions, and has 2 weekly newspapers.

MOUNT VERNON, the home and burial place of George Washington, situated on the right bank of the Potomac, in Fairfax co., Va., 9 m. S. by W. from Alexandria and 15 m. from Washington city. At the time of Washington's decease the estate comprised several thousand acres, divided into farms devoted to different kinds of culture. The mansion is beautifully situated on a swelling height crowned with trees and commanding a fine view up and down the Potomac. The house is of wood, two stories in height and 96 feet in length, with a lofty portico extending along the whole front. On the ground floor are 6 rooms, none large except the dining room. The library and Washington's bedroom remain as they were at the time of his death, and contain many articles of great interest. In front of the house sloping to the river is a lawn of 5 or 6 acres. About 300 yards S. of the mansion, on a hillside in full view of the river, is the old family vault, where the body of Washington was first laid and remained till 1830, when it was removed to a new vault

at no great distance on the edge of a deep wooded dell. Mount Vernon mansion was built by George Washington's elder brother Lawrence, who settled there in 1743, and named the estate in honor of Admiral Vernon, under whom he had served in the West Indies. George Washington added wings to the mansion, and greatly enlarged and embellished the estate, which was his home from boyhood till his death, when by his will it was bequeathed to Bushrod Washington, from whom it passed into the possession of his nephew John A. Washington. By him it was sold in 1858 for \$200,000 to the "Ladies' Mount Vernon Association," who design to hold it in perpetuity as a place of public resort and pilgrimage. Means have been collected by private subscription and by the efforts of Mr. Edward Everett to pay the purchase money, of which at present (Nov. 1860) only \$2,000 remains unpaid, and to establish a fund for keeping the place in order. Their purchase comprises the mansion, the tomb, and 200 acres of the original estate. About \$20,000, beside what has been paid to Mr. Washington, has already been expended upon it.

MOUNTAIN, *THE* (Fr. *la montagne*), a name applied during the French revolution to a party in the convention which occupied the highest benches on the left. The deputies composing it were the most ultra of the revolutionists and the leaders of the Jacobins and Cordeliers. From the fall of the Girondists to that of Robespierre they were the ruling party. By degrees the name came to denote any association of persons of similar principles to the deputies of the extreme left, and nearly every commune in France had its *montagne*. In the constituent assembly of 1848 and the legislative assembly of 1849-'52 the appellation was revived.

MOUNTAINS, portions of the earth's surface which rise to a great height above the level of the sea, in the form of peaks and ridges, and groups of these called chains. The elevation which gives to them the name of mountains is considerable, not in relation to the great body of the globe itself, in comparison with which the irregularities of the surface are insignificant, but as it appears to the limited observation of man, and is accompanied by changes of climate and of vegetable productions, which in a level country would be effected only by differences of many degrees of latitude. Thus the high peaks of the Himalaya and of the Andes, mounting into regions inaccessible to man, and to his view presenting the sublimest objects in nature—their feet among the palms of the tropics, and their summits covered with the never wasting snows of polar climes—are really of so trifling height, that upon a map of the globe spread out even over 80 feet in length a bit of pasteboard placed upon the spots they occupy would fairly represent by its thickness their proportional elevation. The slight difference of 350 feet in height is equivalent in its effect upon the mean temperature to a difference of latitude of 60 miles, each being accompanied by a change of

about 1° F.—The mountains of the earth rarely occur isolated, but in groups and chains; and those of the eastern and western hemispheres present several marked distinctions. In each the principal chains range with the greatest longitudinal extent of the continent they traverse; but in the new world this is on the meridians, while in the old it is on the parallels of latitude. In North and South America the chains are comparatively narrow, and are composed of numbers of parallel ridges, which with great uniformity in their features continue near together sometimes for several hundred miles. In the old world much less regularity is perceived in the distribution of the mountains. The chains widen out over broad territories, and several chains in neighboring groups are connected together by high table-lands or plateaux, from which rise the loftiest mountains upon the globe. This is the case with the great mountainous district of central Asia, 1,500 miles in width, upon the range of the chains from northern Africa to the N. E. coast of Asia. Upon these belts the ridges are rarely found in parallel lines, as in the American continent, but more commonly diverging from each other, and in northern China spreading out like a fan. In the new world the line of the coast on the Pacific side lies along the range of the Andes, by which it seems to be determined; and that of the Atlantic shows a marked conformity to the general direction of the Alleghanies at the north and of the Brazilian mountains at the south; but in the old world this connection is less obvious. Still in both hemispheres it is observed that all the great chains present toward the Pacific and its extension, the Indian ocean, their steeper slope, the opposite slope subsiding over immense tracts of gradually diminishing elevation toward the opposite oceans. This consideration, in connection with the numerous volcanoes in action around the borders of the Pacific and upon its islands, has led to the belief that the vast basin of this ocean was occupied by a continent that has sunk and disappeared in one of the latest great revolutions of the surface.—The geological formations of which mountains are composed belong to different periods, as is evident from the fossil remains they contain; and thus it is that one group is referred for the time of its uplifting to an epoch as recent as the carboniferous, another to that of the jurassic, another to the tertiary, &c. By comparing together the various mountain chains, M. Elie de Beaumont detected a correspondence between their general directions and the period of their elevation, and was thus led to group them into systems, each system comprising all the chains, in whatever part of the world they might be found, which lay on parallel courses. The theory has lost much of the favor with which it was received, it being found that the number of systems would equal the number of points of the compass, and a single chain in some cases proving to be the result of successive elevations at different geological epochs. But, how-

ever this may prove, the same geological formations impress upon the mountains they compose a similarity of form and appearance. And thus it is that, whether in one hemisphere or the other, the bold and rugged slopes with projecting masses of rock are seen to be of granitic character; the rounded gentle slopes betray the calcareous strata within; the high needle-like peaks suggest the mode of weathering peculiar to the crystalline slates and gneiss; the precipitous walls marked in vertical lines tell of basaltic columns; and the conical isolated hills, with their truncated horizontal summits, are monuments of volcanic fires, that may have been extinguished long previous to any human records. So through many other varieties of outward form the accustomed eye recognizes the rock (hidden it may be beneath the soil and vegetation) to which these surface outlines are peculiar. The steepness of the slopes of mountains, as remarked by Mrs. Somerville in her work on "Physical Geography," is very generally and curiously exaggerated. Vertical precipices of great height are very rare; in the whole range of the Alps there is not one 1,600 feet high; and the surface of many in other regions as well as this, which seems to approach this degree of steepness, proves to be on the other side of 45°, or nearer the horizontal line. Thus on the steep sides of Mont Blanc, toward the Allée Blanche, the slopes are less than 45°; and the mean inclination of the peak of Teneriffe is given by Humboldt at only 12° 88'. The Silla of Caracas, which rises precipitously from the Caribbean sea, at an angle of 53° 38', to the height of between 6,000 and 7,000 feet, is a majestic instance of perhaps the nearest approach to perpendicularity of any great height yet known.—Though the height of mountains is insignificant in comparison with the dimensions of the globe, their influence upon climate, the precipitation of rain, and the circulation of the winds, is of immense importance to the human race. This is treated under various heads in this work, as **ANDES**, **GHAUTS**, **HIMALAYA MOUNTAINS**, **METEOROLOGY**, **RAIN**, **WINDS**, &c.—The highest summits upon the globe are among the Himalaya mountains, and of these the most elevated peak is Mt. Everest, the height of which above the level of the sea is 29,002 feet. Several other peaks rise from 25,000 to over 28,000 feet. Great numbers of mountains in Asia exceed 15,000 feet. In the Andes the Nevado de Sorato is 25,300 feet high, and the two summits of Nevado Illimani rise 24,200 and 24,450 feet above the sea. Chimborazo is 21,440 feet high, and Cotopaxi, the highest active volcano in the world, 18,858 feet. In Mexico the volcano of Popocatepetl is 17,720 feet high, and the plateau of Mexico 7,500 feet. That of California is 6,000 feet high. The highest peaks of the Sierra Nevada are from 15,000 to 17,000 feet high. The highest summits of the Rocky mountains are 13,500 feet. Of the Appalachian mountains there are 12 peaks in North Carolina from 6,300 to 6,700 feet in height. (See

BLACK MOUNTAINS.) Mt. Washington in New Hampshire is 6,285 feet high, Mt. Katahdin in Maine about 5,000, and Tahawus in New York 5,387. In Europe the highest mountains are Mont Blanc, 15,775 feet; Monte Rosa, 15,150; and Finster-Aarhorn, 14,106. Several peaks among the Pyrénées exceed 11,000 feet. Mt. Etna is 10,874 feet, and Vesuvius 8,978. The mountains of Abyssinia, in Africa, attain the height of 18,000 feet, and Kilimandjaro and other snow-covered mountains in the countries south of Abyssinia are supposed to be still higher. The peak of Teneriffe in the Canary islands is 12,180 feet high, and the Table mountain of the Cape of Good Hope 3,582 feet.

MOUNTAINS OF THE MOON, a mountain range said to exist in central Africa, in which Ptolemy and other ancient geographers placed the sources of the Nile. On modern maps, until recently, the name was given to a great range which was supposed to cross the continent from E. to W., from the Indian ocean to the Atlantic, at the general distance of 8° or 10° N. of the equator. It is now known, however, that no such range exists, and the name was recently applied by the African explorer Capt. Speke to a range N. of the newly discovered lake Tanganyika, though incorrectly, according to his fellow traveller, Capt. R. T. Burton.

MOURAVIEFF. See **MURAVIEFF**.

MOURNING, an outward manifestation of grief, particularly on occasions of death. Every nation has some conventional form of mourning. The ancient Hebrews tore their garments, dishevelled their hair, threw dust or ashes on the head, and abstained from washing. During the time of mourning they sat on the ground, and went bareheaded and barefooted. The usual period of mourning was 7 days, but for Moses and Aaron they mourned a month. On public occasions professional mourning women were employed. The modern Hebrews preserve to a great extent the customs of their forefathers, such as sitting on the ground, and making an incision in some part of their clothing to symbolize the old tearing of garments. This last practice was observed by the Egyptians, who also sprinkled their heads with dust and ashes, struck their breasts, allowed their hair to grow and their dress to hang neglected, went unwashed, and abstained from wine and other delicacies. The women ran crying through the streets with disordered hair and exposed bosoms. The Lycians, regarding grief as unmanly, had a law which compelled men when they went into mourning to put on female garments. The Syrians wept for their dead during a number of days in solitary places.—The Greeks withdrew into retirement, cut off their hair, put on black, or in some states, as Argos, white garments, rolled themselves in the dust or mire, threw ashes on their heads, tore their clothes, never appeared in public without a veil, lacerated their faces, and frequently uttered the exclamation *ē, ē, ē*, in a mournful tone. When a popular general died, the whole army cut off their hair and the manes

of their horses. In Athens the duration of mourning was about 80 days; in Sparta it was 11 days.—The Roman forms of mourning did not differ greatly from the Grecian. In the time of the republic the color of the mourning dress was black for both sexes, and it always continued so for men; but during the reign of Augustus a white veil was worn by women, and subsequently a complete costume of white became their conventional token of sorrow. Ornaments for the person were laid aside, and the men, instead of cropping their hair and beards, let them grow long. The extreme duration of mourning was 10 months, but this period was abridged by the occurrence of any auspicious event, such as the birth of a child, the happening of any piece of good fortune to the family, certain religious feasts, or the consecration of a temple. The period of public mourning for the death of a great person or for a public disaster was fixed by special decree. At such times the forum, baths, shops, temples, schools of exercise, and other places of concourse were closed, the senators put aside the laticlave, the consuls sat on a lower seat than usual, and the magistrates appeared without their badges of office. On private occasions the mourning was done almost wholly by the women; the men wore black only for a few days, and the domestic ceremonies in honor of the deceased terminated on the 9th day after the funeral with a sacrifice called *novendiale*. A widow who married again during her time of mourning for a husband (10 months or a year) was accounted infamous and debarred from inheriting of her late spouse. Persons in mourning kept within doors, and the custom of tearing the garments was sometimes practised. Hired mourning women were employed at funerals by both Romans and Greeks.—Among the modern Syrians mourning women play a very important part at funerals, and frequently perform their avocation in a really affecting manner. There is no fixed period of mourning, the ceremonies, which are repeated at certain intervals, being indefinitely prolonged according to the relationship of the deceased and the wealth of the survivors. It is not unusual for families in moderate circumstances to be ruined by the expensive feasts and other commemorations which are held for weeks after the funeral. In the old tombs which have been opened in Palestine, as well as in Greece and Rome, are found lachrymatories or tear bottles, in which, as we read in ancient authors, it was customary for mourners to preserve their tears.—In Arabia the men wear no mourning. The women stain their hands and feet with indigo, which they suffer to remain for 8 days, and during this time they abstain from milk on the ground that its white color ill accords with the gloom of their minds. The hired mourning women of Medina dance before the house of the deceased, tearing their arms, faces, and hair like furies.—The Chinese mourn in white, and on the death of a near relative every article of dress, from the cord which ties up their queue

down to the shoes, must be of that color. Less intense affliction is indicated simply by caps and girdles of white linen, and a very moderate degree of grief by shoes and queue cords of blue. Mourning on occasion of the death of a parent or husband is enforced by the penalties of 60 blows and a year's banishment. The duration of mourning is fixed by law. For a father or mother it is 3 years, but in the case of government officers it has been reduced to 27 months. During this period of mourning a Chinese cannot perform the duties of any public office. For 80 days after the demise the nearest kindred must not shave their heads nor change their dress, but rather exhibit a slovenly and slipshod appearance. When the emperor dies all his subjects let their hair grow for 100 days. At funerals the relatives of the deceased furnish all who take part in the procession with mourning dresses, just as gloves and scarfs are given at the present day in Europe and America. They employ mourning women, whose faculty of shedding tears was remarked by Father Huc as something extraordinary.—The Japanese mourning color also is white, but it is a remarkable fact that relatives in the ascending line and seniors neither mourn for their junior kindred nor go to their funerals. Persons in mourning stay at home for 50 days, abstain from animal food and from the intoxicating liquor *saki*, and neither shave their heads nor pare their nails. This period of 50 days, called the *imi*, is succeeded by the *buku*, or 18 months of a sort of "second mourning," during which it is not allowed to wear bright colors or enter a Sinto temple. These long periods are only observed on the death of parents; for other relatives the *imi* and *buku* vary from 80 days and 18 months for a husband to 3 days and 7 days for cousins and their children. The laboring classes are not required to go into mourning at all, but some of them do so for 2 or 8 days.—In the Feejee islands, after the death of a chief, a general fast until evening is observed for 10 or 20 days, the women burn their bodies, and 50 or 100 fingers are amputated to be hung above the dead man's tomb. The ceremonies of domestic mourning consist of abstinence from delicate dishes, and from the use of oil on the person; the mourners sleep on the bare ground, and use only leaves for dress. These customs are optional; among those exacted by fashion are the "jumping of maggots," or a meeting of friends on the 4th day after the funeral to picture to themselves the corruption of the corpse, and the "causing to laugh" on the next night, when comic games are held. The introduction of a comic element in mourning was not confined to the Feejee islands, for a troop of buffoons used to exhibit their antics in the funeral processions of the Romans. About the 10th day of Feejee mourning the women scourge all the men except the highest chiefs. Among the natives of New Caledonia there is a custom for women to burn parts of their bodies in time of mourning. The Sandwich islanders denote

grief by painting the lower part of their faces black and knocking out their fore teeth.—Among all civilized modern nations there is a great similarity in mourning customs, and black is universally considered the proper color to be worn, although in the fashions for ladies' dresses modern refinement has gone so far as to symbolize the gradual change from the depth of affliction to a normal state of cheerfulness by a gradual return from black to the gay colors through the intermediate hues of purple and violet, which are recognized as "second mourning." The material of a mourning dress is also prescribed by fashion, being for ladies generally crape. The time varies, according to the degree of relationship of the deceased, from a week to a year, the latter being the period fixed by custom for a widow. Hired mourners are retained by the English, as attendants at funerals, but their office with them is one of mere show, and they are commonly called mutes. In some parts of Ireland, however, the *keeners* or professional mourners, generally old women, are famous for their extravagant lamentations. It was anciently the custom in England to give mourning rings and suits at funerals. On occasion of the burial of Samuel Pepys, the famous diarist (1708), 123 rings and 40 suits of mourning were thus distributed. In France, of old, the color of grief was white. Certain forms of private as well as public mourning were prescribed by Napoleon I., but went out of use at the restoration. Court mourning in Europe for members of the reigning family, even in remote degrees, is prescribed by ceremonials which give the minutest directions as to dress. The sovereign wears violet, except in England, where the color is black; but violet was formerly used there also. The courtiers appear in black. Court mourning seldom lasts more than 6 months. Public mourning, though rarer than it was of old, is not yet banished from the civilized world. It was witnessed in the United States on the death of Franklin, Washington, and Lafayette. Members of legislative, civic, military, and other associations usually wear a piece of crape on the left arm on public occasions for 30 days after the death of any one of their comrades.

MOUSE, the common name of the smaller members of the rodent sub-family *murina*. This sub-family is characterized by incisors smooth in front and compressed laterally; molars $\frac{3}{2}$ — $\frac{3}{2}$ or $\frac{3}{2}$ — $\frac{3}{2}$, rooted, the anterior the largest; the ante-orbital foramen a deep narrow slit, widening above; palate mostly on one plane; the descending branch of the lower jaw has not the angles above the plane of the crowns of the molars; other characters in the palate and lower jaw sufficiently distinguish them from *arvicolina* or meadow mice; feet usually naked beneath; the hind legs the longest and 5-toed, the anterior with only 4 and a kind of wart for a thumb; clavicles complete; tail more or less scaly, with hairs passing out between the whorls of the scales. They hold their food

in the fore paws, and sit on their haunches to eat it; most of them burrow and swim well. Reserving the larger species for the article **RAT**, this sub-family may be subdivided into two principal groups: *murea*, confined in the wild state entirely to the old world; and *sigmodontes*, exclusively American. The former have very large and broad molars, with 8 tubercles in each transverse series of the upper jaw; the latter have narrower molars, with 2 tubercles in each similar series. There is in the old world a 3d group, *merionides*, intermediate to the above, with plane molars and transverse complete lamellæ, found in Africa and central Asia.—In the murine group of this sub-family, the genus *mus* (Linn.) has the molars of opposite sides parallel to each other, no cheek pouches, the upper lip divided, the whiskers in 5 series, the nose sharp and hairy to the cleft, and the large, prominent ears nearly naked; the nails are short, pointed, and curved; palms naked, with 5 small balls, those of the hind feet the largest; the hair is soft and fine; the mammae are 10, 8 pairs on the lower abdomen and 2 pairs on the chest. More than 50 species are described, including the house rats; the only one here called a mouse is the common little creature of our houses (*M. musculus*, Linn.). This well known animal varies much in color, from almost black to pure white; the albino or white mice are a mere variety of the common animals, but have the ability of propagating their race *inter se*, as most pet-fanciers know; there have been several specimens seen recently of what are called "singing mice," which do not differ in appearance from ordinary mice, but which make, especially at night, a pleasing whistling noise somewhat like the feeble chirp of a canary bird. The house mouse was originally a native of Europe and central Asia, but is now spread over most inhabited regions of the world; in some parts of the United States, and particularly in newly settled districts, it is replaced by the white-footed mouse (described below), which commits about as much mischief in houses and out-buildings as the common mouse. Of European field mice may be mentioned the *M. sylvaticus* (Linn.), or wood mouse, found in fields and gardens, where they make large deposits of provisions in subterranean burrows, laying up grain, nuts, acorns, &c., for winter use. It is a smaller species than the house mouse, reddish gray above, and white below; the hind legs are so long that it moves by jumps, making the transition to *meriones* (Ill.). The harvest mouse (*M. minutus*, Pall.; *M. mesourius*, Shaw) is only $2\frac{1}{4}$ inches from end of nose to root of tail, this being about 2 inches more. These tiny and pretty mice make nests of leaves and straws among standing corn and in thistles, and are often carried into barns with the harvest, where they live and multiply; in winter they retire to burrows and corn ricks; the color is ruddy above and white below. The lined mouse (*M. pumilio*, Gmel.), from the Cape of Good Hope, weighs less than

4 scruples (80 grains). Some mice of the genus *dendromys* (Smith) live on trees; the upper incisors are grooved, the fore feet 8-toed with a thumb-like wart, and the long tail is thinly haired and ringed; here belongs the *M. mesomelas* (Licht.).—Among the American or sigmodont mice will be mentioned here only the genera *reithrodon* (Waterh.) and *hesperomys* (Waterh.), as *neotoma* and *sigmodon* belong properly among the rats on account of the large size of all their species. In *reithrodon* the ears and tail are short and hairy, and the upper incisors are grooved longitudinally in front; 3 species of rat-like size have been found in the extreme southern portion of South America, while the North American ones resemble slender house mice; the body is depressed, limbs short, head broad and short, tail about as long as the body, thumb rudimentary and with a short nail, and heel hairy; the North American species are found in the southern states on the Atlantic border, and from St. Louis westward to the Rocky mountains, and to the Pacific territories. The harvest mouse (*R. humilis*, Baird) is about 2½ inches long, with the tail a trifle less; in color and general appearance it so nearly resembles a small house mouse, that it can only be distinguished at the first glance by the grooved incisors; the eyes are small; it is rarely injurious to the farmer, preferring grass lands to grain fields for its habitation. In *hesperomys* or the vesper mice, the typical species have long tails scantily haired, large ears, the quick motions of the common mouse, and generally white feet and a whitish tail. The old genus was of very great extent, embracing a large portion of the American *murids*; the South American species, most of them too large to be considered mice, have been arranged by Burmeister under the genera *calomys*, *habrothrix*, and *ozymicterus*, established by Waterhouse, the first resembling the common mouse, the 2d the meadow mice (*arvicola*), and the 3d the lemmings. Baird divides even the North American species into 3 groups, as follows: *hesperomys* (Waterh.), containing 18 species; *onychomys* (Baird), and *oryzomys* (Baird), each with a single species. In *hesperomys* the form is mouse-like, tail not less or even longer than the body without the head, claws weak, hind legs and feet long, and soles naked or less than half hairy. The white-footed or deer mouse (*H. leucopus*, Le Conte) is between 8 and 4 inches long, with tail about the same; the color of the adult is yellowish brown above, darker on the back, the lower parts of the body and tail and the upper surface of the feet white; the young are dark slaty; the eyes and ears are large, and the fur long and soft. It is distributed from Nova Scotia to Virginia, and as far west as the Mississippi, and is a common inhabitant of houses and barns; it is nocturnal in its habits, as active as a squirrel, nesting in trees, in the fields, in barns and houses, and making a dwelling resembling a bird's nest; it feeds principally on grain, seeds, nuts, and

acorns, and is very fond of maize; it produces 2 or 3 broods in a season, according to latitude 5 or 6 at a birth; it is not very injurious to the farmer, most of the mischief commonly attributed to it being due to the *arvicola* or meadow mice; great numbers are destroyed by the smaller carnivorous mammals and birds. Allied species are found in Texas, California, the southern states, and on the Pacific coast. The cotton mouse (*H. gossypinus*, Le Conte) makes its nest under logs and in trees, often robbing the Georgia planter of more than a pound of cotton for a single nest. The hamster mouse (*H. myoides*, Gapper) has been mentioned under HAMSTER. The prairie mouse (*H. michiganensis*, Wagner) is 3½ inches long, with a tail of 1½ inches, and the smallest of the genus; the color is grayish brown above, whitish beneath, with the cheeks yellow. The Missouri mouse (*H. leucogaster*, Pr. Max.), the type of the group *onychomys*, has the clumsy form of the *arvicola*, tail less than half the head and body, claws large and fossorial, the posterior ½ of the soles densely furred, and the skull without crest; the body is 4 inches long and the tail 3½ inches; grayish brown above, passing into yellowish red and fulvous on the sides; feet and under surface of body and tail white; the eyes are large, the ears rather short, and the whiskers long; it lives on the seeds and roots of wild plants, and sometimes on corn. The rice-field mouse (*H. palustris*, Wag.), the type of *oryzomys* of Baird, has a rat-like form, ears nearly buried in the fur, coarse hair, tail longer than head and body, hind feet long, soles naked, and upper margin of the orbit raised into a compressed crest; it is over 5 inches long, and the tail about the same; the color is rusty brown above, and whitish below. It is found in the rice fields of Carolina and Georgia, burrowing in the dams just above the water line; it scratches up the newly planted rice, eats it in the milky state, and gleans it from the fields in autumn; it is a good swimmer and diver; it eats also seeds of marsh grasses, and sometimes small mollusks and crustaceans.

MOUTON, GEORGES. See LOBAU.

MOVERS, FRANZ KARL, a German orientalist, born in Koesfeld, Westphalia, July 17, 1806, died in Breslau, Sept. 28, 1856. He was the son of a watchmaker, and a member of the Roman Catholic church. He studied at Münster, was ordained in 1829, and officiated in the pulpit from 1830 to 1839, when he was appointed professor of Old Testament theology at the Catholic faculty of Breslau, which office he held till his death. His principal work, *Die Phönizier*, presents a comprehensive view of Phœnician history. The 1st volume (Breslau, 1840) treats of the religion and the divinities of the Phœnicians; the 2d volume bears the title of *Das Phönizische Alterthum*, and is divided into two parts, embracing the political history (1849) and the colonial history (1850) of that nation; the 1st part of the 3d volume (1856) treats of navigation and commerce.

MOWATT (RITCHIE), ANNA CORA, an American actress and authoress, born about 1821 in Bordeaux, France, where her father, Samuel G. Ogden, a merchant of New York, was then established in business. She was the 10th of a family of 17 children, and her early childhood was passed in an elegant chateau in the neighborhood of Bordeaux, in the private theatre attached to which she frequently participated in the juvenile dramatic performances with which her brothers and sisters were accustomed to amuse themselves. When she was about 6 years of age the family returned to New York, and Miss Ogden in the intervals of her daily studies devoted much time to reading and private dramatic entertainments. At the age of 14, while yet at school, she attracted the attention of James Mowatt, a lawyer of New York, to whom, with the consent of her parents, she was soon after engaged, with the understanding that she was not to be married until she had reached the age of 17. Before the appointed time, however, she made a runaway match with him. During the first two years of her married life she continued her studies with great diligence, and published also two poems, "Pelayo, or the Cavern of Covadonga," an epic in 5 cantos, and the "Reviewers Reviewed," a satire directed against the critics of the former poem. At the end of this period her health began to fail, and she made a visit of a year and a half to Europe, during which she wrote for private performance a play entitled "Gulzora, or the Persian Slave," which was afterward published. Not long after her return financial difficulties overtook her husband, and as a means of providing for their support she gave a series of public dramatic readings in Boston, Providence, New York, and other cities. The exertions incident to this career, however, produced a serious illness, and for two years she was a confirmed invalid. She employed herself during this interval in contributing articles to the magazines under the pseudonyme of Helen Berkley, and also wrote a 5 act comedy entitled "Fashion," produced at the Park theatre, New York, in March, 1845, with considerable success. In June of the same year she made her public debut at this theatre as Pauline in the "Lady of Lyons," and thenceforth for many years was a popular actress on the American stage. In 1847 she made an extended professional visit to England, where in 1851 her husband died; and in the latter part of 1854 she played a series of farewell engagements in the United States and left the stage. She was soon after married to Mr. W. F. Ritchie of Richmond, Va., and has since lived in retirement. Her remaining works are: "Armand," a drama produced in 1847, and in which, as in "Fashion," she took a prominent part; the "Fortune Hunter, a Novel of New York Society" (last ed., 1854); "Autobiography of an Actress" (New York, 1855); and "Mimic Life, or Before and Behind the Curtain" (New York, 1856).

MOWING AND REAPING MACHINES, mechanical devices now in general use in the United States and parts of Europe for cutting grain or grass by animal power. Though this important invention was suggested by the ancient Romans, it is believed that the first experiments tending toward practical results were made in Europe in the early part of the present century; while for its general usefulness and present perfection the world has acknowledged its obligations to the genius and enterprise of American inventors. The names of Smith, Bell, Gladstones, and Scott are well known as connected with the experimental working of this machine in England; and those of Hussey, McCormick, Ketchum, and Manny are familiar to nearly every American farmer, as among the many inventors who have improved it and demonstrated its practical utility. The first machines were constructed with the idea of imitating the hand process as nearly as possible. Cutters similar to the ordinary scythe or sickle were employed, and a rotary motion communicated to them through suitable mechanism, from the wheels supporting the machine. This plan of communicating power to the cutting device is still used, but the form and movement of the cutters have been materially changed. A series of small shears were substituted for the scythe or sickle, and these were again superseded by a single series of two-edged pointed knives, standing at right angles with and attached to a horizontal rod or long plate of metal, the whole resembling a saw plate with very coarse teeth. These cutters work through mortised, stationary fingers or guards, a series of which are permanently fixed to the front of the machine, and, being longer than the cutting teeth, project a short distance forward, thus gathering small portions of the grass or straw between them where it is clipped off by the rapid reciprocating passage of the cutters. This device proved superior to either of the others, and with its various modifications has been universally adopted by manufacturers. The names of Adams of New York, Ten Eyk of New Jersey, and Lane of Maine are among the earliest that appear as connected with the invention of harvesters in the United States; but in 1832 Obed Hussey, then of Cincinnati, O., patented a machine to which he applied the saw-toothed cutters and guards. This machine was at once put into practical operation, and, after annual experiments and modifications, was in 1835-'6 favorably noticed by the press. On July 12, 1837, a public exhibition of its operation was made under the direction of the board of trustees of the Maryland agricultural society for the eastern shore of Maryland, and was witnessed by several hundred persons, principally farmers, who expressed great satisfaction with the result. The board also awarded a handsome pair of silver cups to the inventor. During the same season this machine cut in a satisfactory manner 180 acres of oats and barley on a farm in Maryland. Though this implement

would hardly compare with the reaper of the present day, it may be said to have proved its utility, and laid a firm foundation for the experiments which have led to more modern inventions.—Owing to the variety in form and the multiplicity of patented modifications of the several parts of the modern machines, we will give a general description only of their construction and operation. These machines consist of a strong framework, so constructed as to support a driver's seat, the cutting mechanism, and, when used for harvesting grain, a platform on which the grain falls when cut, and from which it is raked or otherwise removed as often as a sufficient quantity for a bundle has accumulated thereon. This framework is somewhat longer than the width of the swath to be cut, which is usually 5 feet, more or less, and of sufficient width for the platform, say 3 feet, except when used for cutting grass, when the platform is dispensed with, as the mown grass is allowed to fall over the cutters directly upon the ground. On the front edge of the frame is fixed the cutting apparatus, consisting of a series of iron guards or pointed fingers which are permanently fastened to the frame and extend 7 inches, more or less, beyond its edge, parallel to each other, horizontal and pointing forward. They are about $8\frac{1}{4}$ inches apart, of suitable size, say $1\frac{1}{4}$ inches, at the base, lessening toward the point. Each guard has a horizontal mortise through it, and being on a line with each other they all form a continuous horizontal mortise or slit through the whole line of guards. The cutters are formed of thin triangular plates of steel, fastened to a straight flat rod or plate of metal. These steel plates are arranged side by side, resembling a saw with teeth 8 inches wide at their base and 4 inches long, sharp on both sides, and terminating in a point. This saw or cutting plate is passed through the slits in the guards with the teeth pointing forward and their points coming even with the centres of the guards. One end of the saw is connected to a crank, which receives a rapid motion through intermediate cog wheels, from the tractive force and motion of the main or driving wheel. The framework with all its mechanism is supported by two or more wheels, the driving wheel being much larger than the other, and the axles so constructed as to admit of the platform, cutters, &c., being horizontal and suspended within a few inches of the ground. The pole is so attached to the framework as to allow the team to walk before the machine on the stubble of the last swath, while the platform with the cutters on its front edge extends on the right at right angles with the direction of the horses, so that the guards and cutters are presented to the standing grain or grass. A large reel, in front

of and parallel with the series of cutters, is sometimes attached to the framework, and, being connected by a band or otherwise to the driving wheel, is made to revolve with it in the right direction to bend back the top of the standing grain or grass, past the cutters and over the platform, which tends to assist the cutting and to insure the backward fall of the grass upon the platform, or the ground in the rear of the machine. A seat for the driver is usually attached directly behind the team, above and over the driving wheel. Some of the machines used for harvesting grain have two seats, one for the driver of the team, and the other so attached to the framework as to seat the raker in a convenient position to remove the grain from the platform.—The litigations among patentees and others interested in the many improvements in these machines, have been so numerous and complicated that we must refer the reader to the records of the courts for all the particulars in relation to the specific claims and awards of the several inventors. But in justice to the genius and enterprise of the modern American inventors whose names appear at the commencement of this article, we may say that since McCormick's award for the best harvester at the industrial exhibition in London in 1851, an active competition for excellence has been carried on at our annual agricultural fairs, which has resulted in a pretty general distribution of prizes. Some patents have been granted for machines for reaping and threshing grain at the same operation, and many for a binding apparatus as an attachment to the reaper; but if any of these have proved successful, they are yet to be brought into general notice.

MOXA, any substance whose gradual combustion on or near the skin is used as a remedy in disease. The mode of treatment was brought into Europe from China and Japan by the Portuguese, but has now fallen into comparative disuse on account of its severity, although in neuralgic and certain other complaints it is still sometimes recommended as an effective counter-irritant. The Chinese use for moxas a cone formed from the down of the leaf of a plant of the mugwort kind (*artemisia moxa*, De Candolle); but the down or pith of many other plants may be used, and the pith of the common sunflower answers very well. In the United States and Europe the operation is usually performed with a roll of cotton wool, which is held upon the skin by an instrument, set fire to at the top, and suffered to burn down. The moxa has often been used in conjunction with acupuncture, the combustible substance being perforated by the needle which is pushed into the flesh to convey the heat directly to the seat of the disease.

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